



US011832764B2

(12) **United States Patent**
Lee et al.

(10) **Patent No.:** **US 11,832,764 B2**
(45) **Date of Patent:** ***Dec. 5, 2023**

(54) **COOKING APPARATUS**

(56) **References Cited**

(71) Applicant: **LG ELECTRONICS INC.**, Seoul (KR)

U.S. PATENT DOCUMENTS

(72) Inventors: **Kookhaeng Lee**, Seoul (KR); **Yangho Kim**, Seoul (KR); **Junho Seok**, Seoul (KR)

1,693,784 A	12/1928	Hollands
2,457,877 A	1/1949	Doner
2,798,930 A	7/1957	Frost
3,169,518 A	2/1965	Scott
3,392,720 A	7/1968	Sherman
3,446,201 A	5/1969	More
3,797,375 A	3/1974	Cerola
3,956,612 A	5/1976	Ballard
4,042,806 A	8/1977	McCartney
4,415,788 A	11/1983	Field
4,431,892 A	2/1984	White
4,549,052 A	10/1985	Simon
4,562,827 A	1/1986	Cerola

(73) Assignee: **LG ELECTRONICS INC.**, Seoul (KR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 36 days.

This patent is subject to a terminal disclaimer.

(Continued)

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **17/564,594**

CN	101277558	10/2008
DE	19757004	7/1999

(22) Filed: **Dec. 29, 2021**

(Continued)

(65) **Prior Publication Data**

US 2022/0117440 A1 Apr. 21, 2022

OTHER PUBLICATIONS

Related U.S. Application Data

Korean Office Action dated Jun. 23, 2022 issued in Application No. 10-2021-0040174.

(62) Division of application No. 16/159,807, filed on Oct. 15, 2018, now Pat. No. 11,234,556.

(Continued)

(60) Provisional application No. 62/571,917, filed on Oct. 13, 2017.

Primary Examiner — Phuong T Nguyen

(74) *Attorney, Agent, or Firm* — KED & ASSOCIATES

(51) **Int. Cl.**

A47J 37/06 (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.**

CPC **A47J 37/0676** (2013.01)

Provided is a cooking apparatus in which a heating plate, a frame, and a pocket part are independently provided and which has a structure that is capable of securing use convenience and safety by a coupled structure of the heating plate, the frame, and the pocket part.

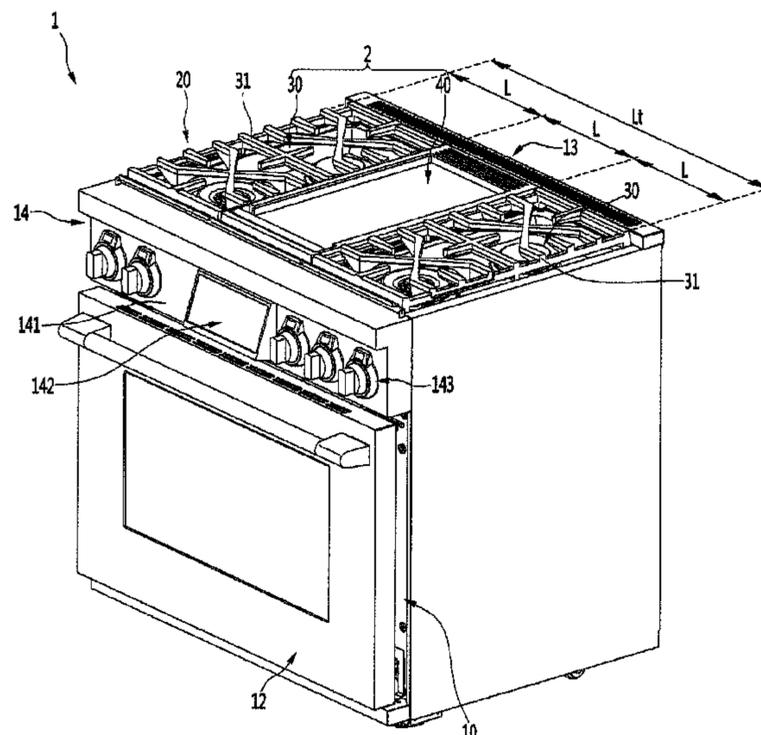
(58) **Field of Classification Search**

CPC A47J 37/06; A47J 27/002; A47J 36/00; A47J 37/067; A47J 37/0676; A47J 37/0682

USPC 99/340, 341, 342, 343, 422, 425, 445

See application file for complete search history.

19 Claims, 22 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

4,608,917 A 9/1986 Faaborg
 4,917,006 A 4/1990 Bowen
 4,922,079 A 5/1990 Bowen
 5,190,026 A 3/1993 Doty
 5,301,653 A 4/1994 Gerdes
 6,032,662 A 3/2000 Taplan
 6,271,504 B1 8/2001 Barritt
 6,274,848 B1 8/2001 Von Mosshaim
 7,140,206 B2 11/2006 Braun
 7,150,166 B2 12/2006 Braun
 9,372,002 B2 6/2016 Harward
 10,415,835 B2 9/2019 Billman
 2002/0043529 A1 4/2002 Pickering
 2002/0096509 A1 7/2002 Von Mosshaim
 2004/0245246 A1 12/2004 Bakanowski
 2005/0051148 A1 3/2005 Sung
 2006/0027561 A1 2/2006 Lee
 2006/0049725 A1 3/2006 Simon
 2006/0174863 A1 8/2006 Menegon
 2008/0060634 A1 3/2008 Blum
 2008/0202493 A1 8/2008 Dettloff
 2009/0283090 A1 11/2009 Garvin
 2009/0296371 A1 12/2009 Desmet
 2010/0154655 A1 6/2010 Mehta et al.
 2010/0175682 A1 7/2010 Erikson et al.
 2010/0219179 A1 9/2010 Lin
 2011/0041831 A1 2/2011 Dettloff
 2011/0241503 A1 10/2011 Simon
 2013/0206128 A1 8/2013 Sovar
 2013/0292371 A1 11/2013 Braden
 2013/0323663 A1 12/2013 Harward
 2013/0327314 A1 12/2013 Green
 2014/0047943 A1 2/2014 Camli
 2014/0191639 A1 7/2014 Freeman
 2014/0261009 A1 9/2014 Bringe et al.
 2014/0263276 A1 9/2014 Harward
 2015/0075513 A1 3/2015 Paller

2015/0096550 A1 4/2015 Paller
 2015/0096974 A1 4/2015 Freeman
 2015/0292747 A1 10/2015 Daughtridge, Jr.
 2015/0323194 A1 11/2015 Chadwick
 2015/0323195 A1 11/2015 Chadwick
 2015/0323196 A1 11/2015 Chadwick
 2015/0335200 A1* 11/2015 Ortner A47J 37/0676
 99/425
 2016/0296012 A1 10/2016 Ciccacci
 2016/0296013 A1 10/2016 Ciccacci
 2016/0298858 A1 10/2016 Ciccacci
 2017/0023254 A1 1/2017 Cadima
 2017/0227231 A1 8/2017 Pionek
 2017/0332838 A1 11/2017 Dahle et al.
 2018/0038596 A1 2/2018 Briscoe
 2018/0206311 A1 7/2018 Yantis
 2018/0209660 A1 7/2018 Stokes
 2018/0353005 A1 12/2018 Lee et al.
 2019/0137109 A1 5/2019 Bruckbauer

FOREIGN PATENT DOCUMENTS

DE 20 2005 01140 1/2006
 EP 1719953 11/2006
 EP 3 415 058 12/2018
 KR 10-1899249 9/2018
 WO WO 2008/125258 10/2008

OTHER PUBLICATIONS

European Search Report dated Jul. 4, 2019 issued in Application No. 18215399.9.
 Korean Office Action dated Mar. 5, 2020.
 U.S. Office Action dated Jun. 4, 2021 issued in U.S. Appl. No. 16/159,807.
 U.S. Appl. No. 17/160,542, filed Jan. 28, 2021.
 U.S. Office Action dated May 11, 2023 issued in U.S. Appl. No. 17/160,542.

* cited by examiner

FIG. 1

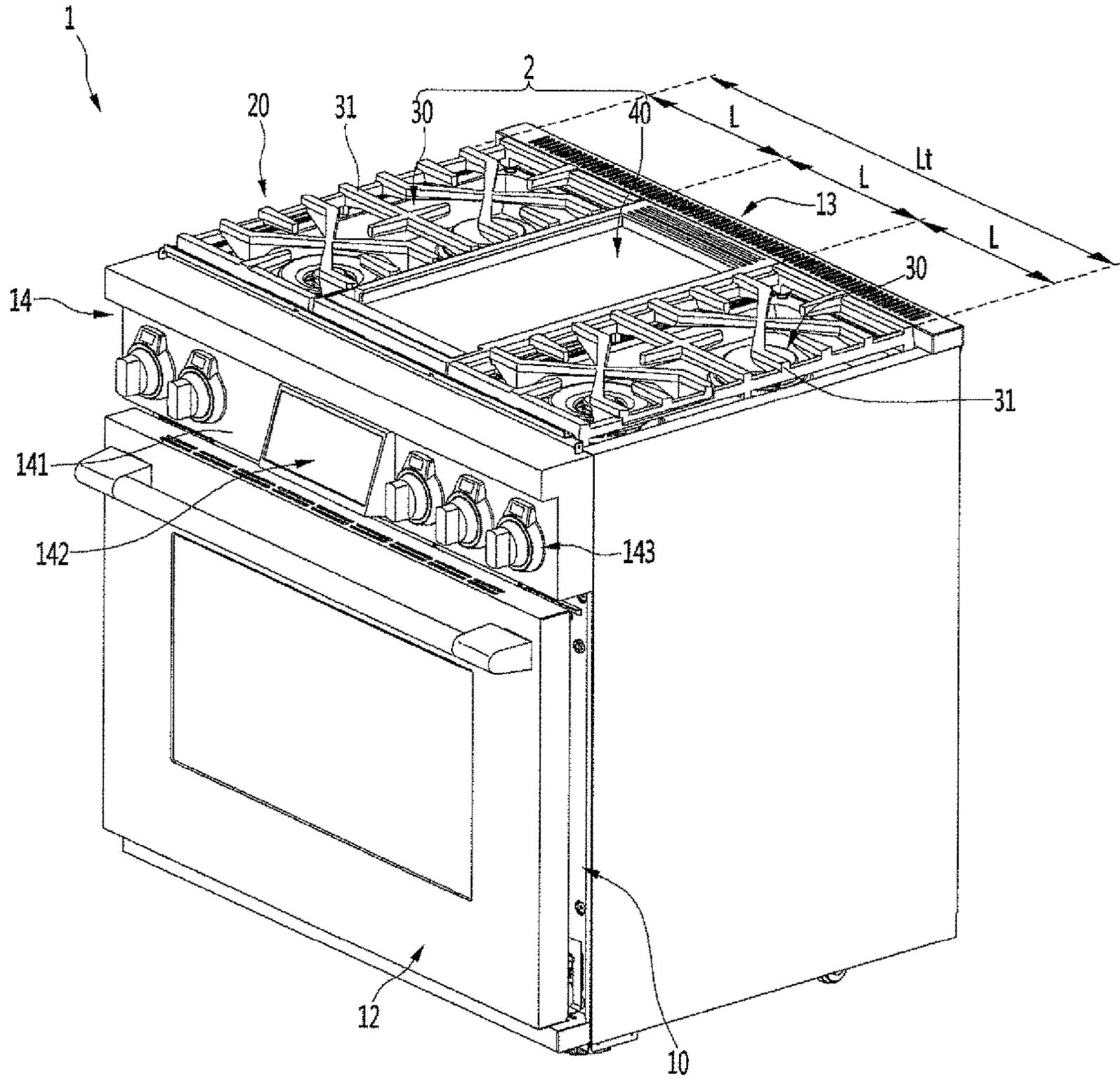


FIG. 3

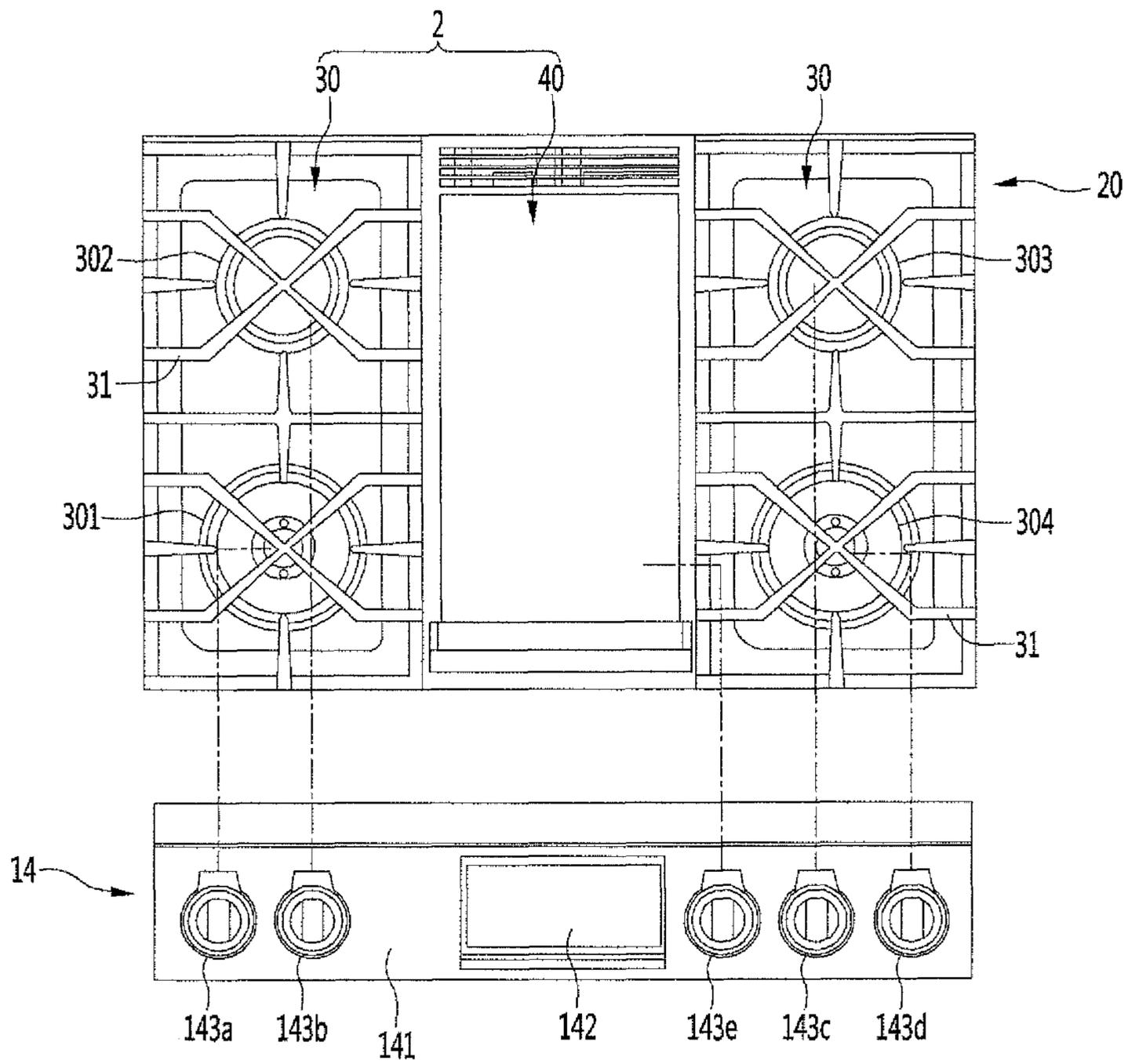


FIG. 5

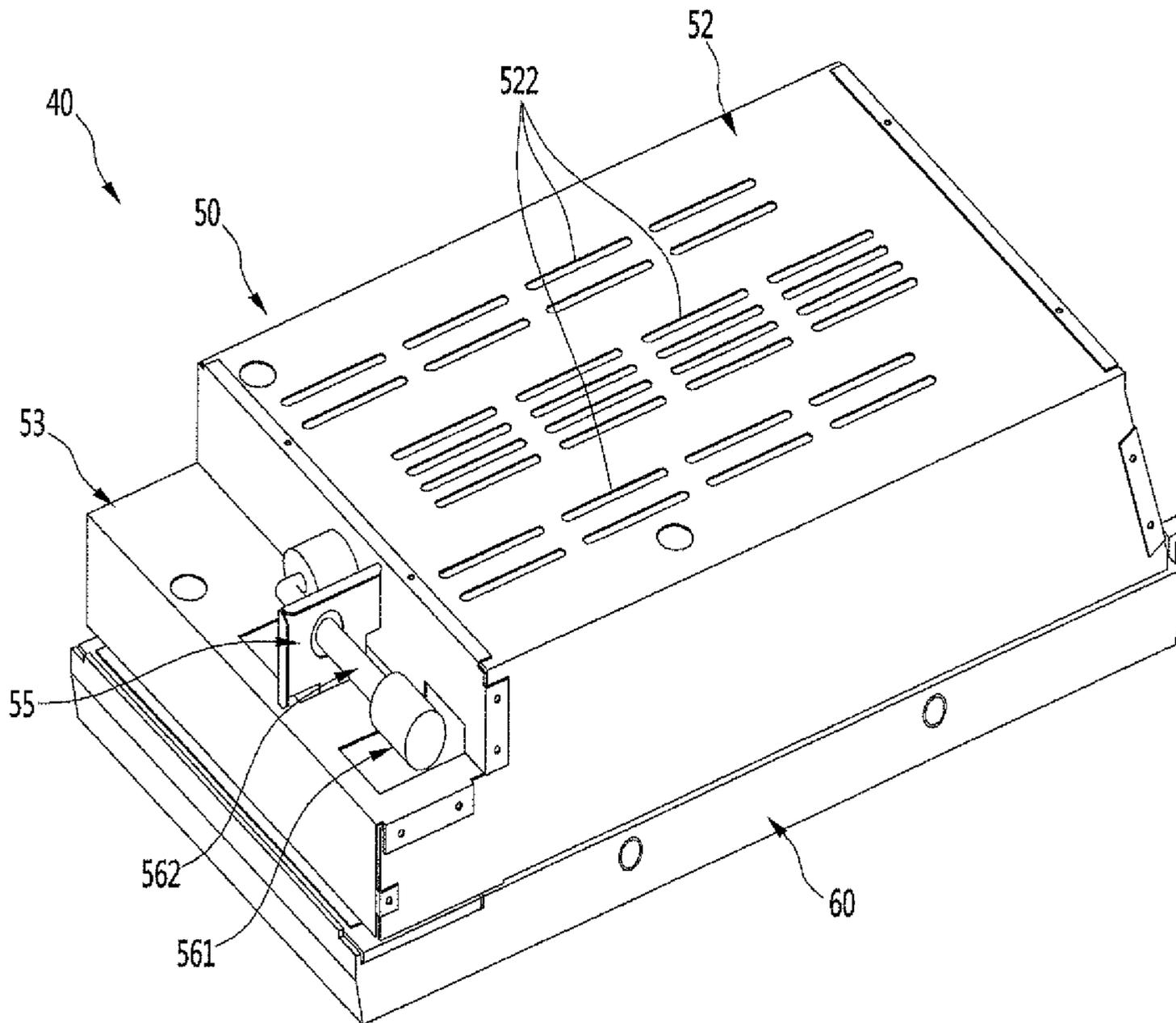


FIG. 6

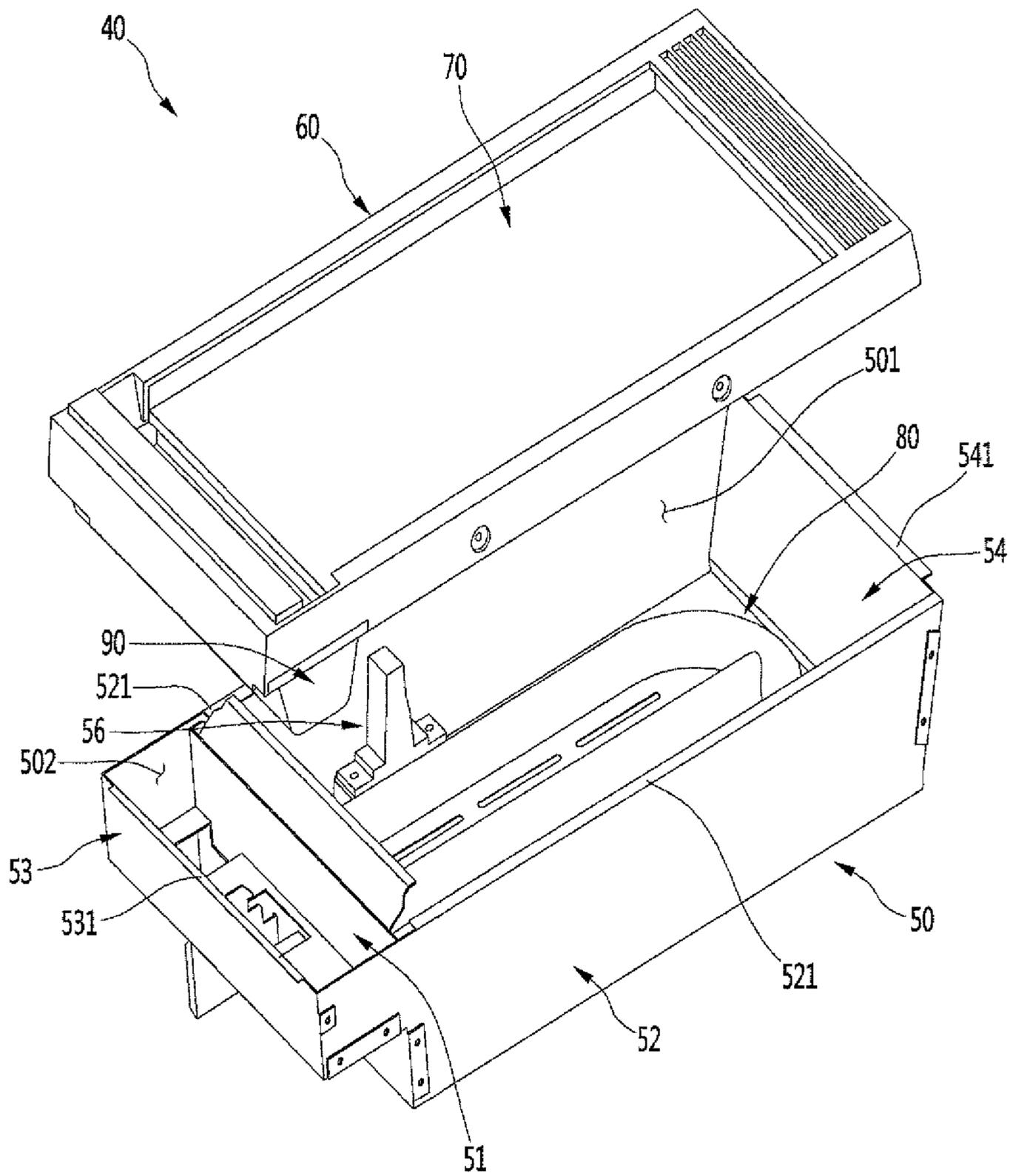


FIG. 7

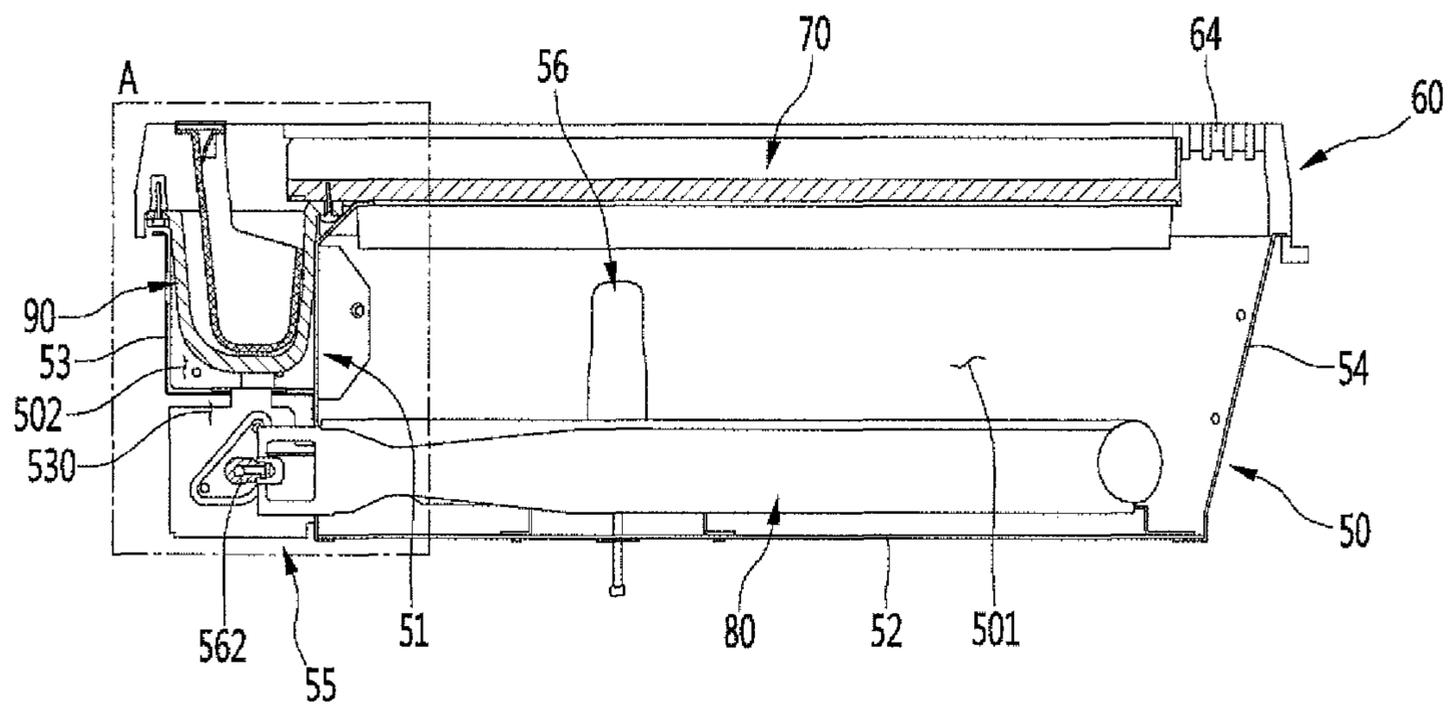


FIG. 8

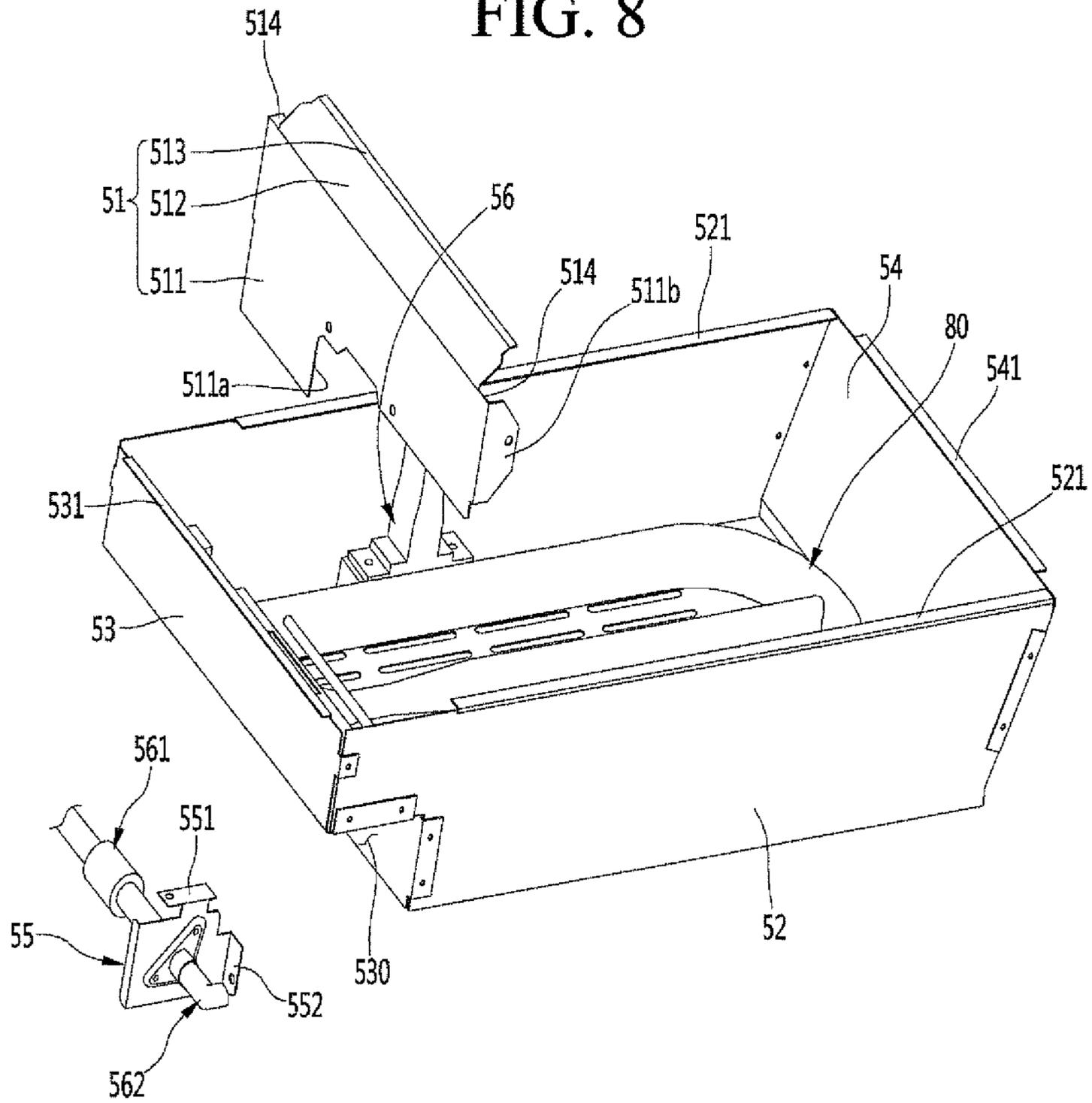


FIG. 9

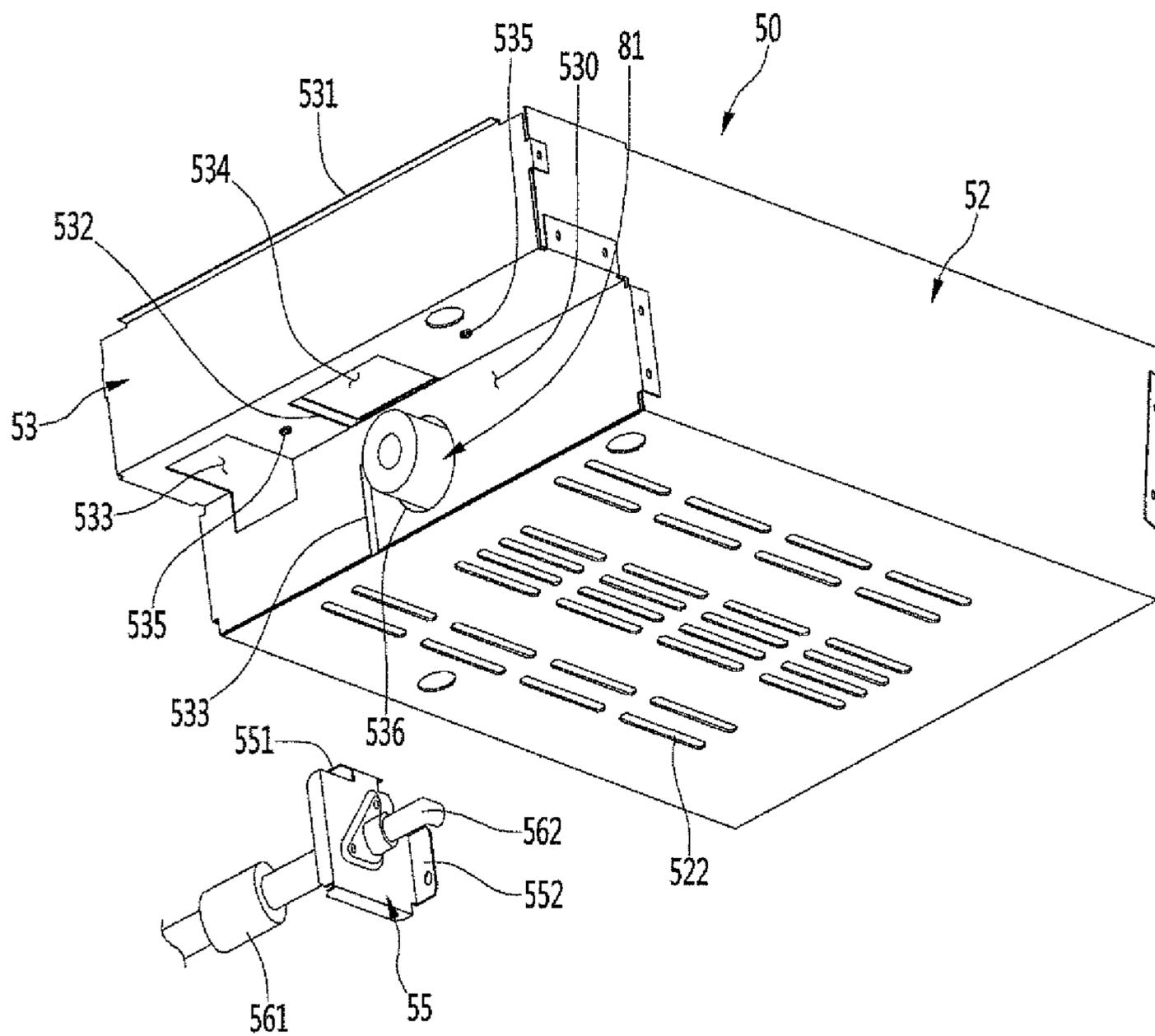


FIG. 10

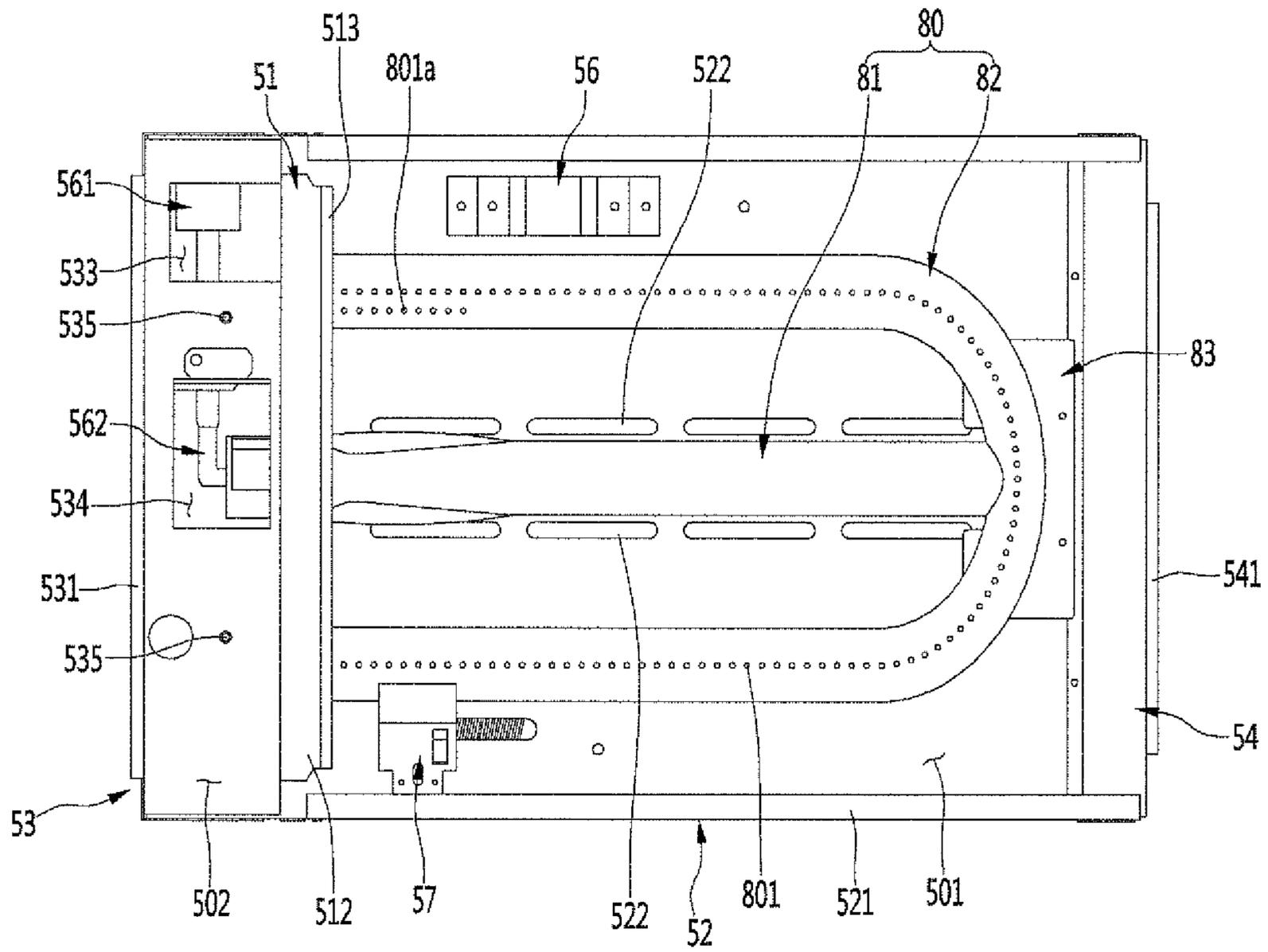


FIG. 12

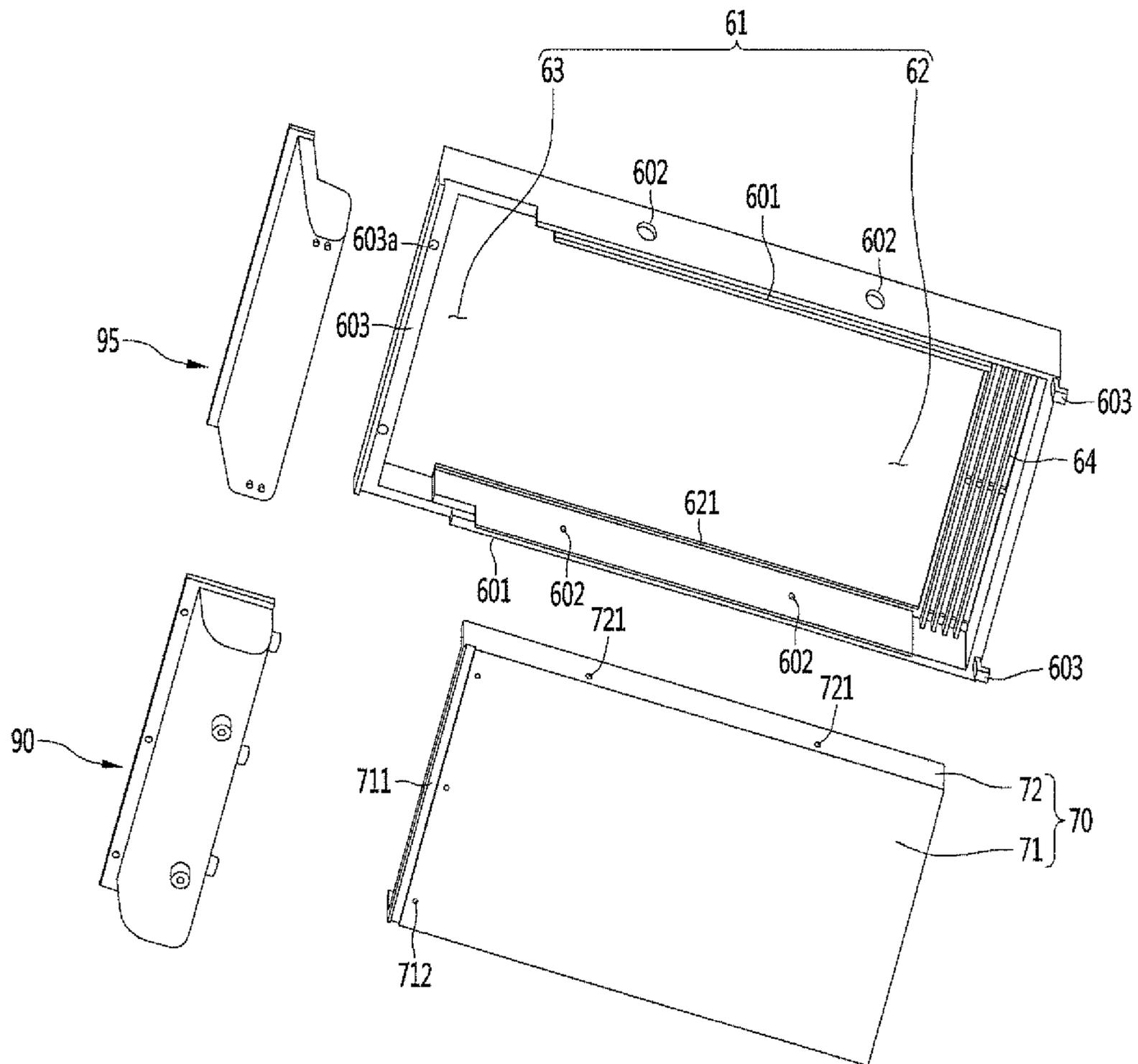


FIG. 13

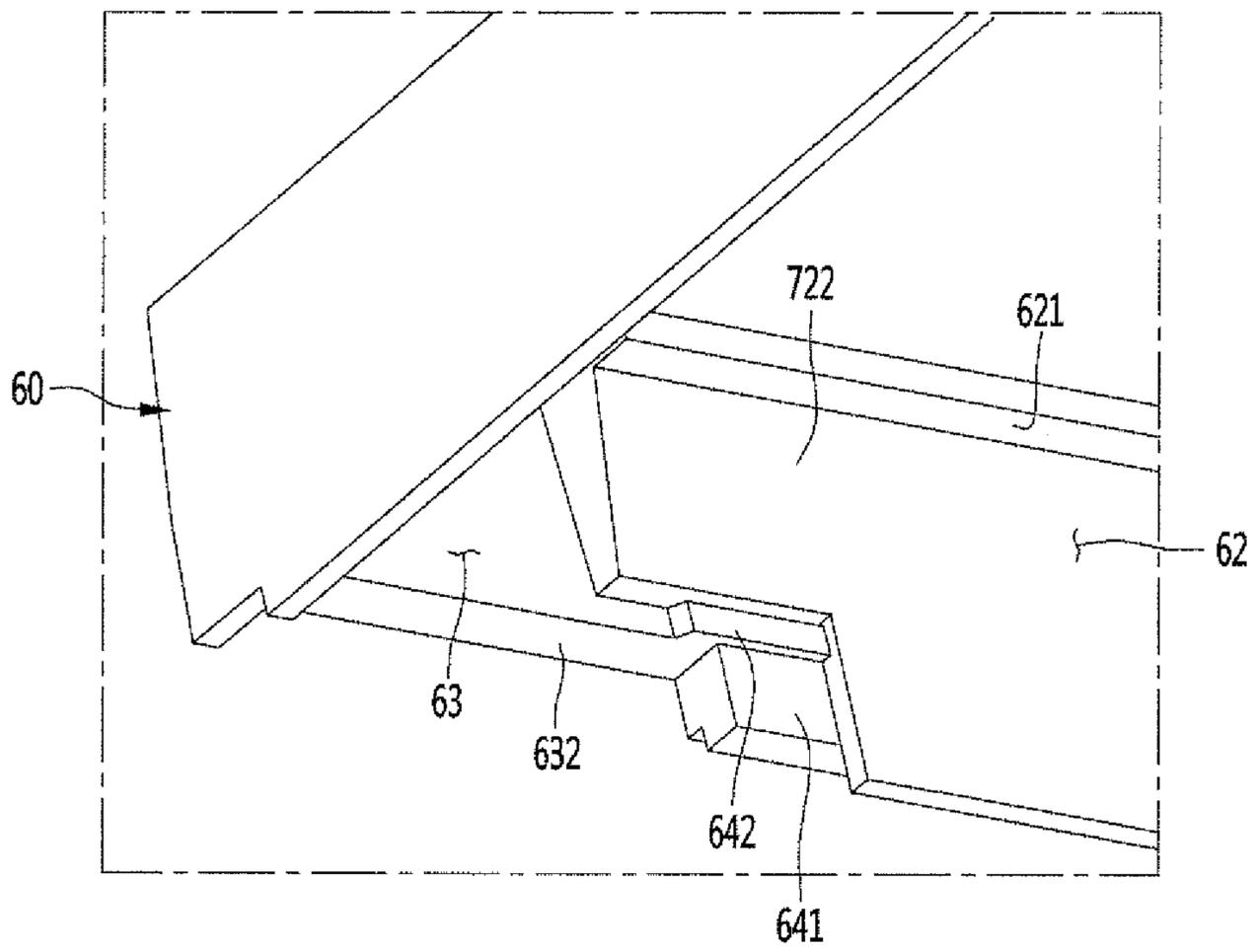


FIG. 14

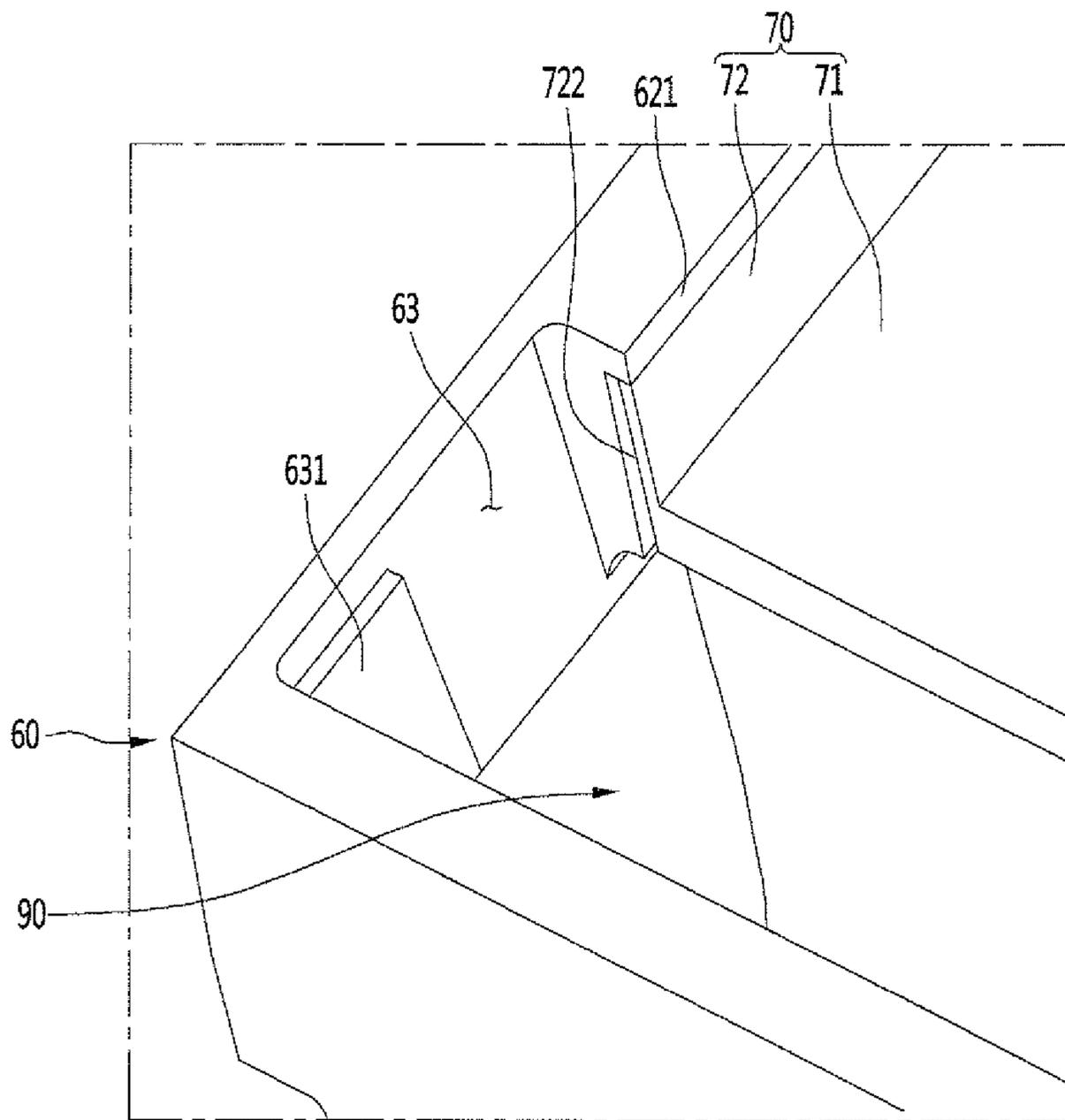


FIG. 15

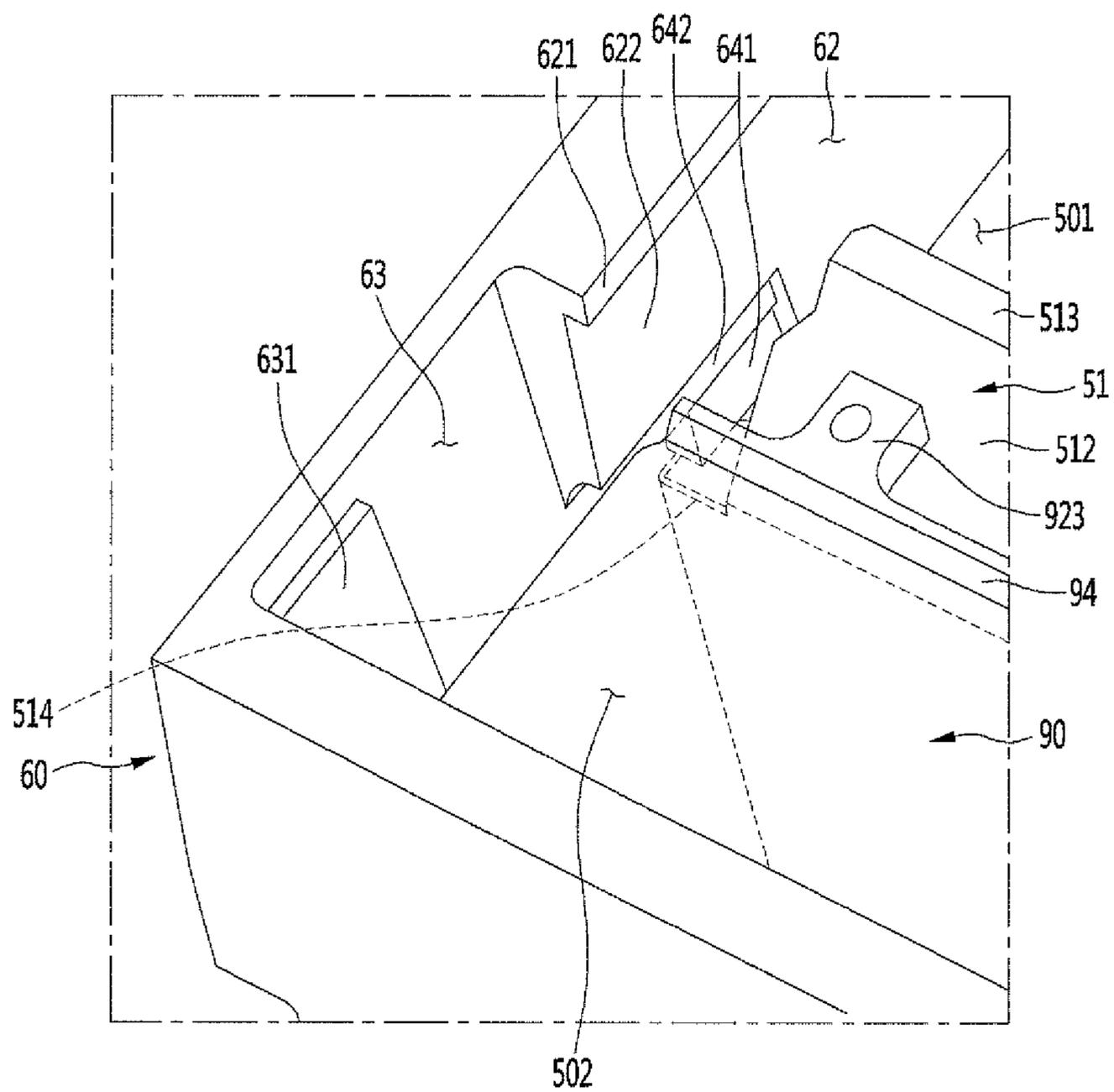


FIG. 16

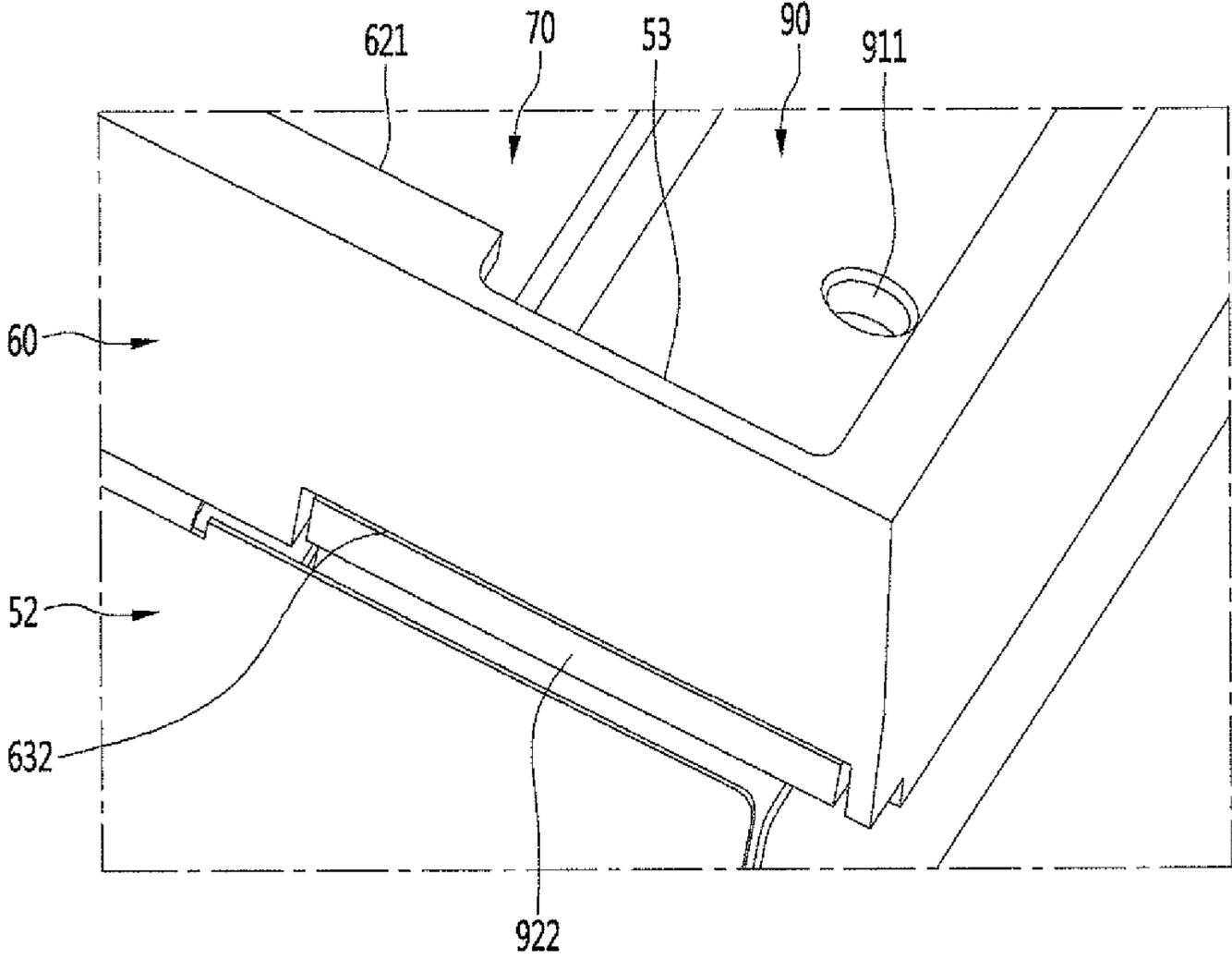


FIG. 17

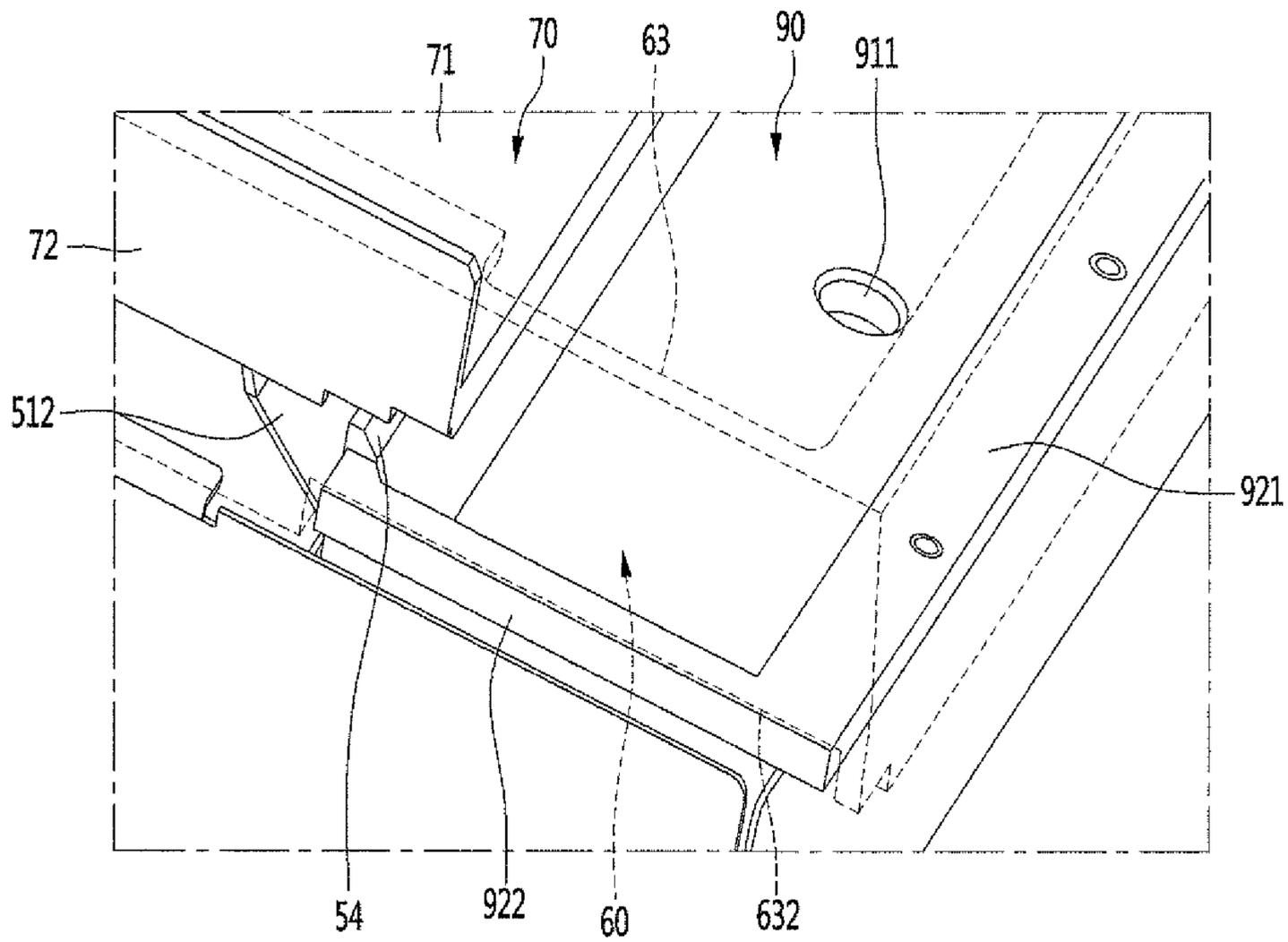


FIG. 18

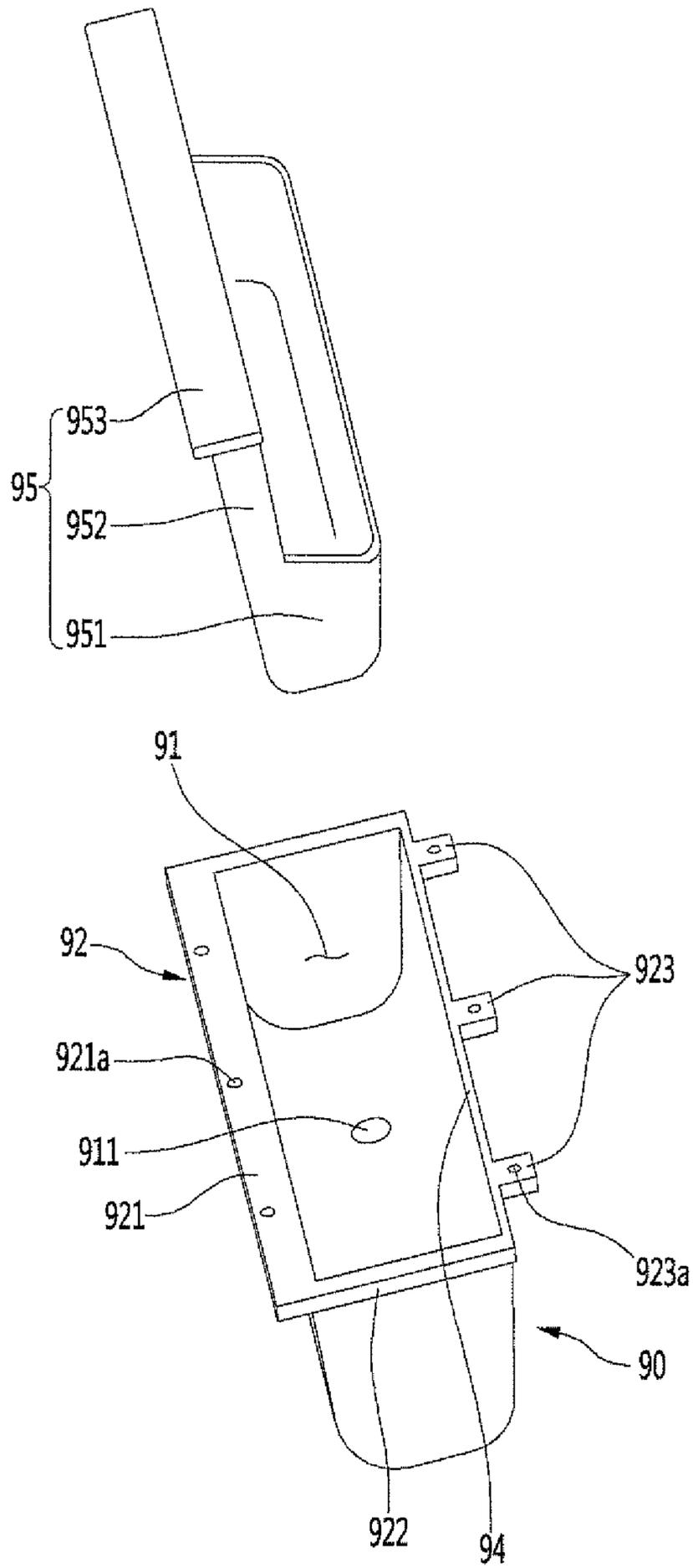


FIG. 19

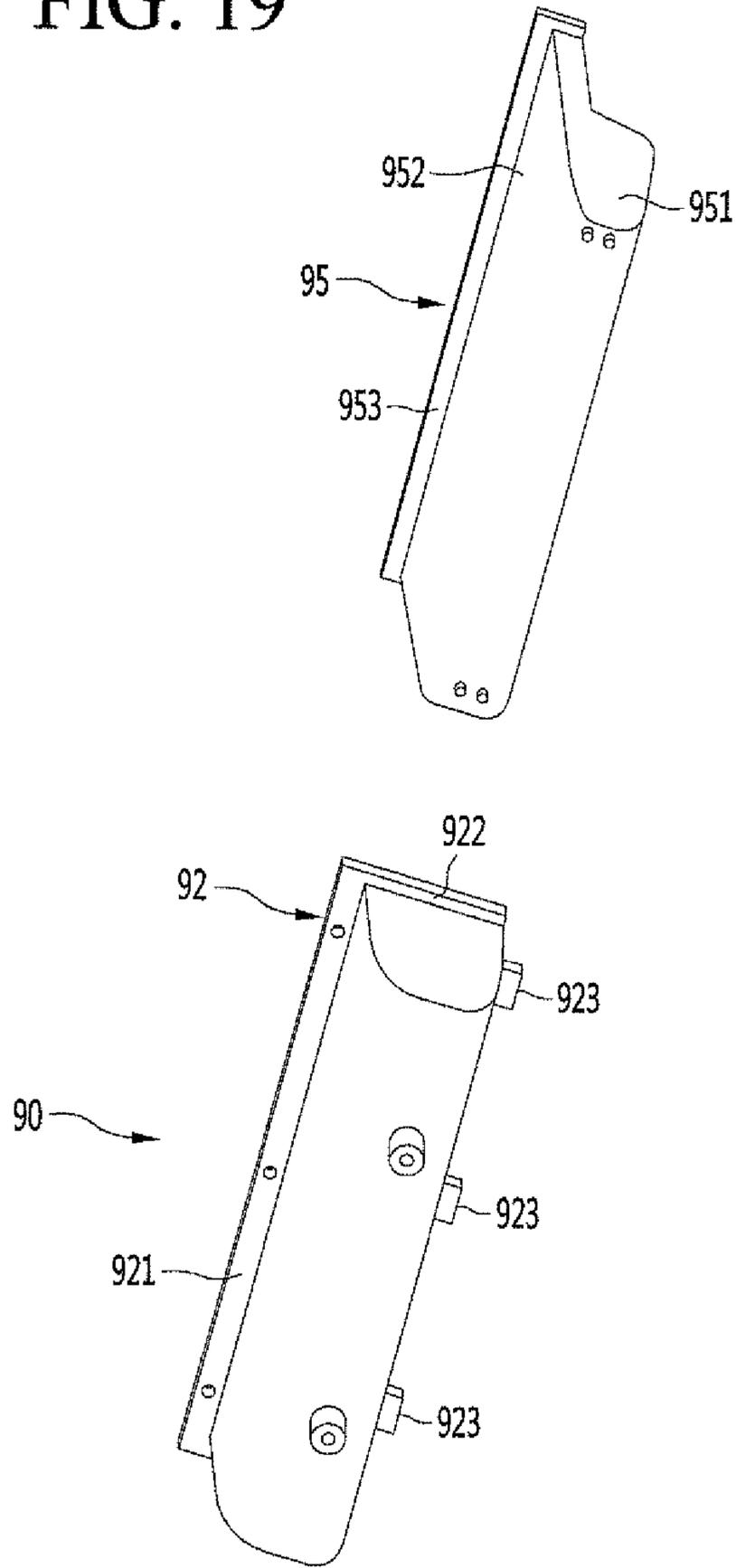


FIG. 21

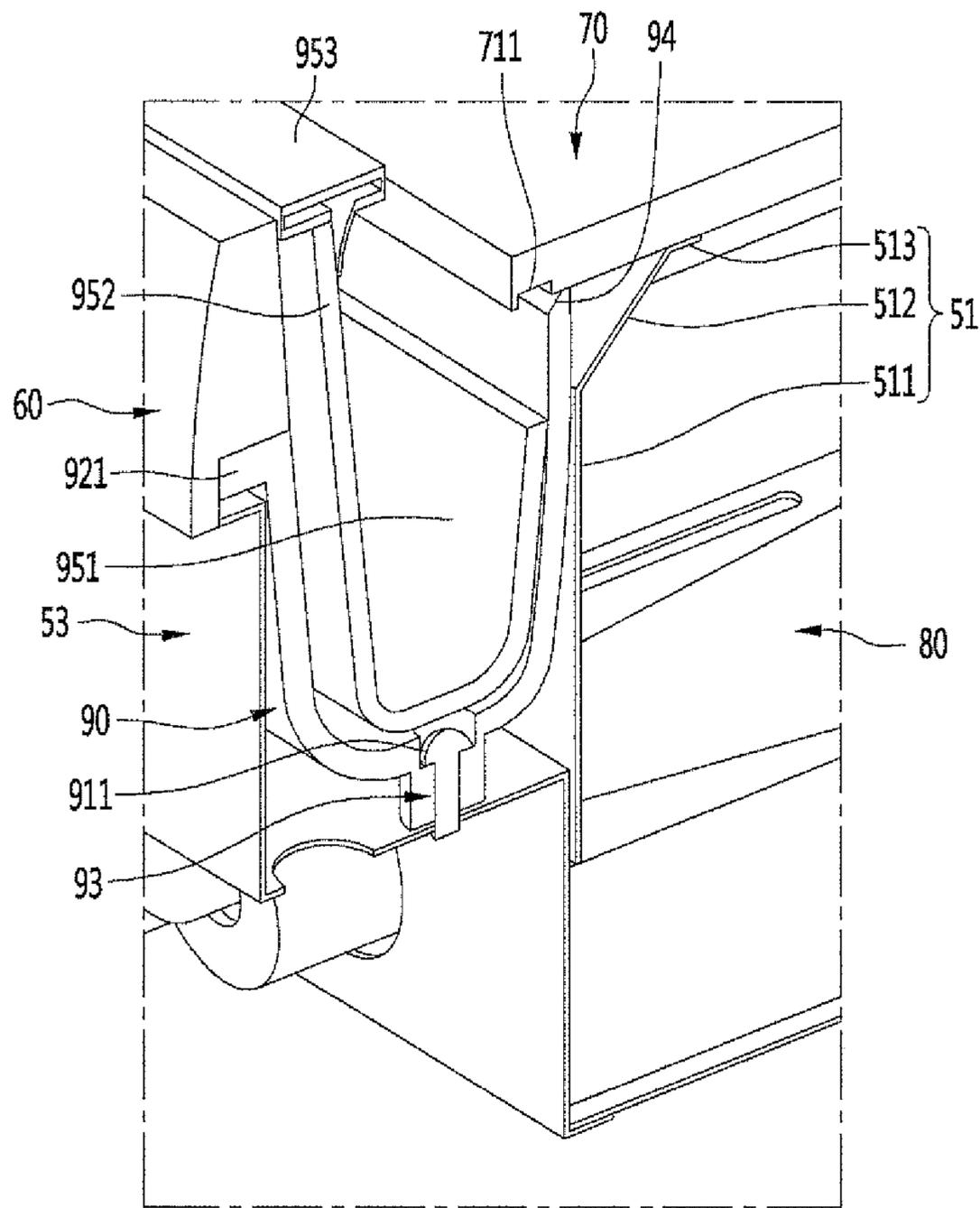
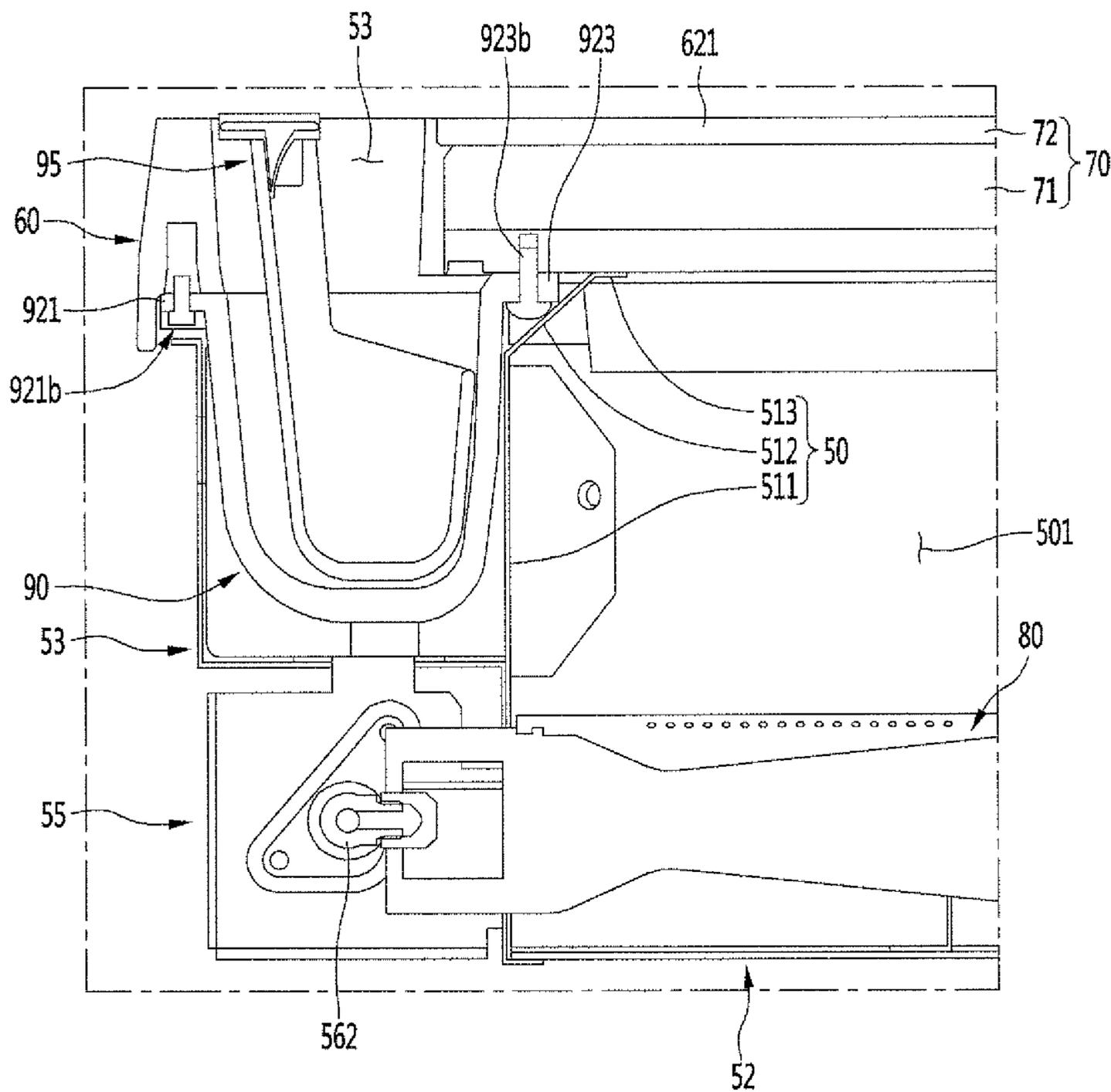


FIG. 22



1**COOKING APPARATUS****CROSS-REFERENCE TO RELATED APPLICATIONS**

This application is a Divisional of U.S. patent application Ser. No. 16/159,807, filed Oct. 15, 2018, which is based on and claims the benefit of U.S. Provisional Patent Application No. 62/571,917, filed on Oct. 13, 2017, which is hereby incorporated by reference in its entirety.

BACKGROUND

The present disclosure relates to a cooking apparatus, and more particularly, to a cooking apparatus in which a configuration of a cooktop part is modularized to be combined in a shape desired by a user.

In general, a cooking apparatus is a home appliance for cooking food, which is installed in a kitchen space to cook the food according to user's intension. Such a cooking apparatus may be classified into various types according to a heat source or type to be used and a kind of fuel.

When the cooking apparatus is classified according to types of food to be cooked, the cooking apparatus may be classified into an open type cooking apparatus and a close type cooking apparatus according to types of spaces in which food is placed. The close type cooking apparatus includes an oven, a microwave oven, and the like, and the open type cooking apparatus includes a cooktop, a hob, and the like.

In recent years, a complex type cooking apparatus in which an open type cooking apparatus is disposed above a close type cooking apparatus has been developed and also has been developed to be combined with apparatuses having various cooking manners and structures.

A griddle is provided in a shape in which a heating unit such as a gas burner or a heating wire is installed below a cooking plate having an opened upper portion. Such a griddle is used for grilling meat, vegetables, and the like on a cooking plate having an iron plate shape, which is heated by the heating unit. The griddle is mainly used in large restaurants and food service stations, but recently is increasingly used for household use.

The griddle has a risk of fire due to oil generated during cooking and thus requires careful attention during the cooking and use.

SUMMARY

Embodiments provide a griddle device having improved use convenience and a cooking apparatus including the griddle device.

Embodiments also provide a griddle device having improved safety and a cooking apparatus including the griddle device.

Embodiments also provide a griddle device having improved assemblability and productivity and a cooking apparatus including the griddle device.

Embodiments also provide a griddle device having an improved outer appearance and a cooking apparatus including the griddle device.

Embodiments also provide a griddle device having a structure that is capable of being mounted at one side of a cooking apparatus in a module manner.

Embodiments also provide a cooking apparatus in which a plurality of modularized cooking devices have a common mounting structure.

2

In one embodiment, a griddle device includes: a housing having an opened top surface; a burner provided in the housing; a frame disposed along an opened circumference of an upper end of the housing and having a frame opening; a heating plate coupled to the frame to cover a portion of the frame opening and providing a cooking surface heated by the burner; and a pocket part configured to cover a remaining portion of the frame opening at one end of the heating plate and recessed to provide a space in which foreign substances are accommodated, wherein the pocket part is mounted to be connected between the frame and the heating plate.

The heating plate may include: a heating part providing the cooking surface; and an edge part disposed along a circumference of the heating part and extending upward from the heating part to contact an inner surface of the frame opening, wherein the heating part may have a thickness greater than that of the edge part.

The heating part and the edge part may be separately molded and bonded to each other through welding.

The edge part may be disposed along a remaining circumferential surface except for one end contacting the pocket part.

A coupling member coupled to the edge part by passing through the frame may be disposed on an outer surface of the frame.

The frame opening may include: a plate mounting part on which the heating plate is mounted; and a pocket mounting part on which the pocket part is mounted at one end of the plate mounting part, wherein the pocket mounting part may have a width greater than that of the plate mounting part, and both ends of the pocket mounting part may be further recessed than the plate mounting part.

An inner surface of the plate mounting part may have an inclination to protrude inward from a lower side to an upper side.

A pocket tray into which the foreign substances are introduced from the heating plate may be introduced are detachably accommodated inside the pocket part, and a tray seating part on which each of both ends of the pocket tray is seated may be disposed on each of both side surfaces of the pocket mounting part.

A coupling hole may be defined in an inner bottom surface of the pocket part, and the coupling member coupled inside the pocket part may pass through the coupling hole and be coupled to the housing.

A pocket edge protruding outward may be disposed along an upper end of the pocket part, wherein the pocket edge may include: a front part coupled to a front end of the frame; a rear part coupled to a bottom surface of the heating plate; and a side part coupled to each of both side surfaces of the pocket mounting part.

An accommodation groove recessed in a shape corresponding to the side part and coupled to the side part may be defined in a lower end of each of both the side surfaces of the pocket mounting part.

The heating plate may further extend to the inside of the pocket part than the front part.

A plate groove may be recessed from the bottom surface of the heating plate, and the plate groove may be disposed further forward than the front part.

A pocket inclined part that is inclined from the inside of the pocket part to the heating plate may be disposed on an upper end of the front part.

A barrier partitioning the inside of the housing into front and rear spaces may be provided in the housing, the burner

3

may be accommodated in the partitioned front space, and the pocket part may be accommodated in the partitioned rear space.

The barrier may include: a partition part vertically extending from a bottom surface of the housing; an inclined part inclinedly extending from an upper end of the partition part; and a contact part bent from a lower end of the inclined part to support a bottom surface of the heating plate, wherein, when the heating plate is mounted, the inclined part may be elastically deformed to allow the contact part to press and support the heating plate.

The inclined part may have a width less than that of the partition part so that a barrier stepped part is disposed on each of both side ends of the inclined part and the partition part, and the barrier stepped part may be seated on a first stepped part that is stepped on an inner surface of the frame opening.

A second stepped part in which an upper end of the pocket part is accommodated may be further disposed on an inner surface of the frame opening above the first stepped part, and the second stepped part may further protrude than the first stepped part.

In another embodiment, a cooking apparatus includes: an oven part on which a door opening and closing a cavity defining a cooking space is disposed on a front surface thereof; a cooktop part provided above the oven part to define a top surface of the cooking apparatus; and an exhaust part provided behind the cooktop part to exhaust heat of the oven part and the cooktop part, wherein the cooktop part includes: a module mounting space provided in the cooktop part and having an opened top surface; and a griddle device mounted in the module mounting space to define at least a portion of a top surface of the cooktop part, wherein the griddle device includes: a housing having an opened top surface; a burner provided in the housing; a frame disposed along an opened circumference of an upper end of the housing and having a frame opening; a heating plate coupled to the frame to cover a portion of the frame opening and providing a cooking surface heated by the burner; and a pocket part configured to cover a remaining portion of the frame opening at one end of the heating plate and recessed to provide a space in which foreign substances are accommodated, wherein the pocket part is mounted to be connected between the frame and the heating plate.

A gas stove defining a remaining portion of the top surface of the cooktop part may be disposed at a side of the griddle device, and the frame may be made of the same material as a grating defining an outer appearance of an upper portion of the gas stove and disposed at the same height as the grating.

The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a cooking apparatus according to an embodiment.

FIG. 2 is an exploded perspective view illustrating a state in which a griddle is separated from the cooking apparatus.

FIG. 3 is a view illustrating a relationship between a cooktop part and a manipulation part.

FIG. 4 is a perspective view of the griddle when viewed from an upper side.

FIG. 5 is a perspective view of the griddle when viewed from a lower side.

FIG. 6 is an exploded perspective of the griddle.

4

FIG. 7 is a cross-sectional view of the griddle.

FIG. 8 is an exploded perspective view illustrating a state in which a barrier of a housing and a valve bracket are separated from each other when viewed from the upper side.

FIG. 9 is an exploded perspective view illustrating a state in which the valve bracket is separated when viewed from the lower side.

FIG. 10 is a plan view illustrating the inside of the housing.

FIG. 11 is an exploded perspective view illustrating a coupling structure of the frame, a heating plate, a pocket part, and a pocket tray when viewed from the upper side.

FIG. 12 is an exploded perspective view illustrating a coupling structure of the frame, the heating plate, the pocket part, and the pocket tray when viewed from the lower side.

FIG. 13 is a partial perspective view illustrating a main part of the frame.

FIG. 14 is a partial perspective view illustrating a coupling state of the frame, the heating plate, and the pocket part.

FIG. 15 is a projective view illustrating a state in which the heating plate is separated in FIG. 14.

FIG. 16 is a partial perspective view illustrating a coupling state of the frame and the pocket part.

FIG. 17 is a projective view of the frame of FIG. 16.

FIG. 18 is an exploded perspective view of the pocket part and the pocket tray when viewed from the upper side.

FIG. 19 is an exploded perspective view of the pocket part and the pocket tray when viewed from the lower side.

FIG. 20 is a cutaway perspective of the griddle.

FIG. 21 is an enlarged view of a portion B of FIG. 20.

FIG. 22 is an enlarged view of a portion A of FIG. 7.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Hereinafter, specific embodiments of the present invention will be described in detail with reference to the drawings. However, there is no intention to limit the present invention to the embodiments in which spirit of the present invention is provided and other embodiments which is included in the range of spirit of the other degenerative inventions or the present invention can be easily proposed by adding, changing, deleting or the like of another component.

FIG. 1 is a perspective view of a cooking apparatus according to an embodiment. Also, FIG. 2 is an exploded perspective view illustrating a state in which a griddle is separated from the cooking apparatus.

As illustrated in the drawings, a cooking apparatus 1 according to an embodiment may be a complex type cooking apparatus (hereinafter, referred to a cooking apparatus). An oven part 10 may be provided in a lower portion, and a cooktop part 20 may be disposed in an upper portion.

A cavity that is a cooking space may be provided in the oven part 10 and be opened by a door 12 that is openable at a front side thereof. The oven part 10 may be provided on each of both left and right sides. Thus, a pair of cavities may be provided in both left and right sides, and the cavities may be relatively opened and closed by the doors 12. The oven part 10 may be provided in plurality, and the plurality of oven parts 10 may be disposed vertically or horizontally.

A cooktop part 20 may be disposed above the oven part 10. The cooktop part 20 may be disposed on a top surface of the cooking apparatus 1. Also, various cooking devices that are capable of cooking food through the top surface of the cooking apparatus 1 may be mounted on the cooktop part 20

in a module type. Thus, the various cooking devices that are capable of being mounted on the cooktop part **20** may be called cooking modules.

In detail, the plurality of cooking modules **2** may be combined to be mounted on the cooktop part **20** as a whole. The cooking module **2** assembled to constitute the cooktop part **20** may include a gas stove **30** constituted by at least one or more gas burners **501**, **502**, **503**, and **504** and a griddle device **40** that is capable of cooking food on a heated iron plate. Also, as necessary, the cooking module may include an induction stove that is capable of heating a container in an induction heating manner and a sous vide device that is capable of performing sealed cooking at a low temperature such as sous vide cooking.

The cooking modules **2** may be mounted on the cooktop part **20**, and a portion of the plurality of cooking modules **2** may be selectively mounted in a state in which the oven part **10** is assembled. That is, the cooking modules **2** may be continuously arranged in parallel to each other on the cooktop part **20**, and a top surface of the cooktop part **20** may be defined by the plurality of cooking modules **2**.

The cooking modules **2** may be mounted at any position on the cooktop part **20** and be selectively mounted according to required combination. Also, when the cooking modules **2** are freely combined and disposed to be mounted, the cooking modules **2** may be mounted at the same height to provide a sense of unit. In addition, a separate finishing material such as a side deco (not shown) may be provided between the cooking modules **2** to improve the sense of unit.

As illustrated in the drawings, a griddle device **40** may be disposed at a center of the cooktop part **20**, and the gas stove **30** may be disposed at each of left and right sides. Here, the pair of gas stoves **30** disposed at both the sides of the griddle device **40** may have the same structure.

Each of the gas stove **30** and the cooking module **2** including the griddle device **40** may have the same forward backward length as the cooktop part **20**. Thus, when the cooking module **2** is mounted on the cooktop part **20**, front and rear ends of the cooking module **2** may be respectively seated on front and rear ends of the cooktop part **20**.

Also, a length of the cooking module **2** in a horizontal direction (a left and right direction in FIG. 1) may correspond to a 1/N of an total horizontal length Lt of the cooktop part **20** or an inner space of the cooktop part **20** and also correspond to a unit length L.

For example, the length of the cooktop part **20** in the horizontal direction may be set to three unit lengths L, and a horizontal length of each of the griddle device **40** and the gas stove **30** may correspond to one unit length L.

In the state in which all the cooking modules **2** are mounted on the cooktop part **20**, the cooking module **2** may have the same height. That is, the griddle device **40** and the gas stove **30** may be disposed on the same plane in the state of being mounted on the cooktop part **20**. A grating **31** of the gas stove **30** and a frame **60** of the griddle device **40** may be disposed on the same plane to provide a sense of unit to the cooking apparatus **1** as a whole.

Here, the cooking module **2** may be fixed and mounted on a mounting bracket **202** provided in the cooktop part **20**. For example, the mounting bracket **202** may be mounted in a module mounting space **201** defined in the cooktop part **20** to support the griddle device **40** at a lower side. Also, the griddle device **40** may be coupled to the mounting bracket **202** and then fixed and mounted on the cooktop part **20**.

An exhaust part **13** may be provided on a rear end of the cooktop part **20**. The exhaust part **13** may exhaust air within the oven part **10** and also discharge heat within the cooktop part **20** to the outside.

A plurality of holes may be continuously defined in the form of a grill in a top surface of the exhaust part **13**. Also, the inside of the exhaust part **13** may communicate with the oven part **10** and the cooktop part **20**. Thus, when the oven part **10** operates, heat and a combustion gas of the oven part **10** may be exhausted. Also, heat and a combustion gas generated when the cooking module **2** operates may be exhausted. In addition, cooling air introduced into the cooktop part **20** from the outside of the cooking apparatus **1** to cool the inside of the cooktop part **20** may also be discharged through the exhaust part **13**.

A manipulation part **14** is provided on a front surface of the cooktop part **20**. The manipulation part **14** may include a manipulation panel **141** defining the front surface of the cooktop part **20**, a display **142** disposed on a center of the manipulation panel **141** to display operation information of the cooking apparatus **1**, and a manipulation member **143** provided in plurality on both sides of the manipulation panel **141** with respect to the display **142**. The manipulation members **143** may be provided as, for example, knobs and disposed at positions corresponding to mounting positions of the cooking modules **2** constituting the cooktop part **20**. Thus, when the cooking modules **2** are changed in arrangement, the manipulation member **143** may also move to be changed in position.

Also, even though the cooking modules **2** are arranged in any arrangement order in the cooktop part **20**, the manipulation members **143** may be disposed on the corresponding front area. Thus, although various cooking modules **2** are provided, a user may intuitively manipulate the corresponding manipulation member **143**.

FIG. 3 is a view illustrating a relationship between the cooktop part and the manipulation part.

As illustrated in the drawing, the display **142** and the plurality of manipulation members **143** may be disposed on a front surface of the manipulation panel **141**.

The display **142** may display an overall operation state of the cooking apparatus **1** and thus display various information on a screen. Also, the display **142** may be provided as the form of a touch screen to receive user's manipulation. Also, the display **142** may be configured to set and manipulate an operation of the oven part **10** through user's touch manipulation. Alternatively, the display **142** may be configured to set and manipulation operations of the cooking modules **2** in addition to the oven part **10**. The display **142** may have a length that is less than at least one unit length L. Thus, the display **142** together with at least one manipulation member **143** may be provided within an area of the unit length L.

As illustrated in the drawings, in the manipulation members **143**, first to fourth manipulation members **143a**, **143b**, **143c**, and **143d** may be disposed at a front side of the gas stove **30**. The first to fourth manipulation members **143a**, **143b**, **143c**, and **143d** may be disposed on both left and right sides with respect to the display **142**. The first manipulation member **143a** and the second manipulation member **143b** may be disposed at the front side of a first burner **301** and a second burner **302**, and the third manipulation member **143c** and the fourth manipulation member **143d** may be disposed at the front side of a third burner **303** and a fourth burner **304**.

The first manipulation member **143a** may adjust thermal power of the first burner **301**, and the second manipulation

member **143b** may be adjust thermal power of the second burner **302** that is disposed at the front side of the first burner **301**. Also, the third manipulation member **143c** may adjust thermal power of the third burner **303**, and the fourth manipulation member **143d** may be adjust thermal power of the fourth burner **304** that is disposed at the rear side of the third burner **303**.

Also, a fifth manipulation member **143e** capable of adjusting a temperature of the griddle device **40** may be disposed at the front side of the griddle device **40**. The fifth manipulation member **143e** may be disposed at a side of the display **142**. Thus, the fifth manipulation member **143e** and the display **142** may be disposed at a center or a position adjacent to the center of the manipulation part **14**.

Hereinafter, the griddle device **40** mounted on the cooking apparatus **1** will be described in more detail with reference to the accompanying drawings.

FIG. **4** is a perspective view of the griddle when viewed from an upper side. Also, FIG. **5** is a perspective view of the griddle when viewed from a lower side. Also, FIG. **6** is an exploded perspective of the griddle. Also, FIG. **7** is a cross-sectional view of the griddle.

As illustrated in the drawings, the griddle device **40** may have a size that is enough to be mounted on the cooktop part **20** as a whole. The griddle device **40** may have a lower portion accommodated in the cooktop part **20** and an upper portion exposed to the outside to define a top surface of the cooktop part **20**.

Also, the griddle device **40** may include a housing **50** defining a space in which the burner **80** and the like are accommodated, the heating plate **70** heated by the burner **80**, and the frame **60** defining a circumference of the heating plate **70**.

The griddle device **40** may include the housing **50**, the heating plate **70**, and the frame **60**. The griddle device **40** may be mounted on the cooking apparatus **1** to constitute one component of the cooking apparatus **1**. Alternatively, the griddle device **40** may have a structure that is mounted on a separate case (not shown). Also, the griddle device **40** may be used as an independent cooking apparatus that is capable of separately independently mounted and used with respect to the cooking apparatus **1**. Also, the griddle device **40** may have a built-in structure that is capable of being mounted on the cooking apparatus or furniture.

Hereinafter, a portion at which a vent part **64** of the griddle device **40** is disposed will be defined as a rear side, a portion at which a pocket part **90** is disposed will be defined as a front side, a bottom surface of the housing **50** will be defined as a lower side, and a top surface of the heating plate **70** will be defined as an upper side, and also, this structure will be described.

The housing **50** may have a box shape with an opened top surface and be inserted into the cooktop part **20**. The burner **80** in which a supplied gas is burned may be provided in the housing **50**. When the burner **80** is ignited, the heating plate **70** disposed at the upper side thereof may be heated.

The inside of the housing **50** may be partitioned into front and rear spaces by a barrier **51**. The pocket part **90** may be disposed in the front space, and the burner **80** and the heating plate **70** may be disposed in the rear space.

A plurality of air holes **522** through which air for gas combustion is introduced may be defined in the bottom surface of the housing **50**. Also, a front end of the housing **50** may be stepped. A gas valve **561** for supplying a gas to the burner **80** and a connection tube **562** connected to the burner **80** may be disposed in the stepped space.

The opened top surface of the housing **50** may be covered by the frame **60** in the state in which the heating plate **70** and the pocket part **90** are mounted. The frame **60** may define an outer appearance of an upper portion the griddle device **40**, which is exposed to the outside, when the griddle device **40** is mounted.

The frame **60** may be coupled to a circumference of an upper end of the housing. **50**. Also, the rear space of the housing **50** may be covered by the heating plate **70** mounted inside the frame **60**, and the front space of the housing **50** may be covered by the pocket part **90**.

Hereinafter, a structure of the housing **50** will be described in more detail with reference to the accompanying drawings.

FIG. **8** is an exploded perspective view illustrating a state in which the barrier of the housing and the valve bracket are separated from each other when viewed from the upper side. Also, FIG. **9** is an exploded perspective view illustrating a state in which the valve bracket is separated when viewed from the lower side. Also, FIG. **10** is a plan view illustrating the inside of the housing.

As illustrated in the drawings, the housing **50** may be made of a steel material having a plate shape and be bent to define a space having an opened top surface. Also, bent parts **521**, **531**, and **541** may be disposed on the upper end of the housing **50**. Also, the frame **60** coupled to the heating plate **70** may be seated on the upper end of the housing **50**.

The bent parts **521**, **531**, and **541** may include first bent parts **531** and **541** that respectively extend forward and backward from front and rear ends of the housing **50** and a second bent part **521** extending to inside of the housing **50** from each of both left and right ends of the housing **50**.

The housing **50** may be provided by coupling a first plate **52** defining a bottom surface and both side surfaces of the heating space **501**, a second plate **53** defining front and bottom surfaces of the insulation space **502** and a front surface of the heating space **501**, and a third plate **54** defining a rear surface of the heating space **501**.

Also, the inside of the housing **50** may be partitioned by the barrier **51**. The barrier **51** may partition the inner space of the housing **50** into one space in which the burner **80** is accommodated and the other space in which the pocket part **90** that will be described below is accommodated. Here, the space in which the burner **80** is accommodated may be called the heating space **501** or the rear space in which the combustion of the burner **80** occurs. Since the pocket part **90** does not need to be heated and prevents heat of the heating space **501** from being transferred, the pocket part **90** may be called the insulation space **502** or the front space.

The insulation space **502** may be partitioned from the heating space **501** by the barrier **51**. When the frame **60** and the heating plate **70** are mounted, the inside of the housing **50** may have the independent front and rear spaces with respect to the barrier **51**. Thus, the transfer of heat generated when the combustion of the burner **80** occurs into the pocket part **90** within the insulation space **502** may be minimized.

In detail, the barrier **51** may have a plate shape and also have a size corresponding to a horizontal width of the inner space of the housing **50**. Also, the barrier **51** may include a partition part **511** extending vertically from the bottom surface of the housing **50**.

The partition part **511** may extend up to a height that is lower than a bottom surface of the heating plate **70**. Also, a lower end of the partition part **511** may extend up to the bottom surface of the housing **50** or the bottom surface of the insulation space **502**. Also, a barrier cutoff part **511a** through which at least a portion of the burner **80** is accessible may

be provided in a lower portion of the partition part **511**. A barrier fixing part **511b** that is bent may be disposed on each of both ends of the partition part **511**. The barrier fixing part **511b** may be fixed to each of both side surfaces of the housing **50** so that the barrier **51** is maintained in the mounted state.

An inclined part **512** may be provided on an upper end of the partition part **511**. The inclined part **512** may extend to the heating plate **70** and be inclined backward from the front side to the rear side. Here, an upper end of the inclined part **512** may extend up to a height higher than the bottom surface of the heating plate **70**.

The partition part **511** may have a horizontal width less than the inclined part **512**. Thus, a barrier stepped part **514** may be disposed on each of both ends of the partition part **511**. The barrier stepped part **514** may be restricted with an inner surface of the frame **60**.

Also, a contact part **513** bent to contact the heating plate **70** may be disposed on the upper end of the inclined part **512**. Thus, when the heating plate **70** is mounted, the contact part **513** may contact the bottom surface of the heating plate **70**, and the inclined part **512** may be pressed to be deformed somewhat downward. That is, an upper end of the barrier **51** may be closely attached to the bottom surface of the heating plate **70** in the pressed state. Thus, the heat generated when the combustion of the burner occurs inside the heating space **501** may be completely blocked by the barrier **51** to prevent the heat from being transferred into the insulation space **502** through the gap between the heating plate **70** and the barrier **51**.

Also, the upper end of the barrier **51** may be disposed further behind the front end of the heating plate **70**. The inclined part **512** and the contact part **513** may contact a portion that is away from the front end of the heating plate **70**. Also, as illustrated in FIG. **22**, the inclined part **512** may provide a space when being coupled to the pocket part **90** so that the inclined part **512** does not interfere with a rear part **923** of the pocket part **90** and the coupling member **923b** coupled to the rear part **923**.

The insulation space **502** may have a depth less than that of the heating space **501**. Thus, the heating space **501** and the insulation space within the housing **50** may be stepped.

Thus, a space in which a gas valve **561** and a connection tube **562** connecting the gas valve **561** to the burner **80** are disposed may be defined in the front end of the housing **50**. Thus, this space may be called a valve installation space **530**. The gas valve **561** and the connection tube **562** may be disposed in a lower side of the insulation space **502** and a front side of the heating space **501** and be fixed to an outer surface of the housing **50** by a separate valve bracket **55**.

The valve bracket **55** may have a plate shape so that the gas valve **561** or the connection tube **562** passes there-through. Thus, the gas valve **561** and the connection tube **562** may be in a state of being fixed to the valve bracket **55**. Also, a bent upper bent part **551** and a bent rear bent part **552** may be disposed on upper and lower ends of the valve bracket **55**, respectively.

The upper bent part **551** may be coupled by a separate coupling member and thus fixed in a state in which the upper bent part **551** is inserted into a first opening **532** defined in the bottom surface of the insulation space **502**. Also, the rear bent part **552** may be coupled by a separate coupling member and thus fixed in a state in which the rear bent part **552** is inserted into a second opening **533** defined in the front surface of the heating space **501**.

Also, the gas valve **561** and the connection tube **562** may be coupled to each other in a screw coupling manner. A first

connection opening **533** may be defined in the bottom surface of the insulation space at a portion corresponding to the portion at which the gas valve **561** and the connection tube **562** are connected to each other. Thus, the gas valve **561** and the connection tube **562** may be connected to each other through the first connection opening **533**, or the connection between the gas valve **561** and the connection tube **562** may be confirmed through the first connection opening **533**.

Also, a second connection opening **534** may be defined in the bottom surface of the insulation space **502** at a portion corresponding to the portion at which the other end of the connection tube **562** and an end of the burner **80** are connected to each other. The burner **80** and the connection tube **562** may be connected to each other through the second connection opening **534**, or the connection between the burner **80** and the connection tube **562** may be confirmed through the second connection opening **534**.

Also, a coupling hole **535** to which a coupling member **93** coupled by passing through the pocket part **90** is coupled may be further provided in the bottom surface of the insulation space **502**.

A burner hole **536** may be defined in a center of the front surface of the heating space **501**. A rear end of the burner **80**, more particularly, a mixing tube **81** of the burner **80** may be connected to the connection tube **562**.

The burner **80** may include the mixing tube **81** in which a fuel gas and air are mixed with each other at a center thereof and a burner body **82** having a "U" shape, which is connected to the mixing tube **81**. The mixing tube **81** may be connected to a central portion of the burner body **82**, and the mixed gas of the fuel gas and the air, which is introduced into the central portion of the burner body **82** may be supplied along the burner body **82**.

The burner body **82** may have a size that is enough to be filled into the most region of the heating space **501** and be configured to uniformly heat the heating plate **70**.

Also, an air hole **522** may be defined in the bottom surface of the housing **50**, which corresponds to the burner body **82** and the mixing tube **81**. Oxygen that is necessary for the combustion of the burner **80** may be supplied through the air hole **522**. The air hole **522** may be defined vertically below the burner body **82** and the mixing tube **81**. When viewed from the upper side, the air hole may be exposed to the outside by being covered by the burner body **82** and the mixing tube **81**. Also, to prevent user's finger from being injured during the operation, the air hole **522** may be provided as a plurality of hole shapes, each of which has a long length and a narrow width.

A temperature measurement device **56** for measuring a temperature of the heating plate **70** may be disposed at one side of each of both sides of the burner **80**. The gas valve **561** may be opened or closed according to the temperature measured by the temperature measurement device **56**, and also, the measured temperature may be displayed by an external device so as to be confirmed by the user.

Also, an igniter **57** may be disposed at the other side of the burner **80**. The igniter **57** may be configured to ignite the burner **80**. Here, the igniter **57** may heat the burner so that the fuel gas discharged from a flame hole defined along the body of the burner **80** is ignited.

The igniter **57** may radiate high-temperature heat in a state in which the gas valve **561** is opened to ignite the fuel gas. Also, in the state in which the gas valve **561** is opened, the operation of the gas valve **561** may be continuously maintained to be heated. Thus, immediate and continuous re-ignition may be possible even in the event of temporary ignition failure.

11

The flame hole **801** may be continuously defined along a center of the top surface of the burner body **82**. The combustion may occur in the mixed gas injected through the flame hole **801** may generate flame. The generated flame may heat the heating plate **70** at a lower side of the heating plate **70**.

Here, a flame hole **801a** may be further defined in a position of the flame hole **801**, which is opposite to the igniter **57**, in one end of the burner body **82** corresponding to the temperature measurement device **56**. For example, when the flame holes **801** are defined in a first row along the burner body **82** over the entire burner body **82**, the flame holes **801a** may be defined in a second row at the position opposite to the igniter **57**. Thus, the heating plate **70** may be heated at a temperature corresponding to a temperature generated when the igniter **57** operates.

That is, the flame hole **801** may be further defined at the corresponding temperature at the opposite position so that the heating plate **70** is locally heated at a high temperature by the operation of the igniter **57**. In addition, the number of flame holes **801** may be adequately selected according to the heating temperature of the igniter **57**.

A mixing tube **81** passing through the front end of the burner **80**, i.e., the heating space **501** to extend backward may be supported by the housing **50**. Also, the rear end of the burner **80**, i.e., a bent central portion of the burner body **82** within the heating space **501** may be supported to be spaced apart from the bottom surface of the housing **50** by the burner bracket **83**.

The frame **60** may be seated along a circumference of the opened top surface of the housing **50**. Here, the frame **60** may be maintained in a state of being stably supported by the first and second bent parts **531**, **541**, and **521** of the upper end of the housing **50**.

Hereinafter, structures of the frame **60** and the constituents coupled to the frame **60** will be described with reference to the accompanying drawings.

FIG. **11** is an exploded perspective view illustrating a coupling structure of the frame, the heating plate, the pocket part, and the pocket tray when viewed from the upper side. Also, FIG. **12** is an exploded perspective view illustrating a coupling structure of the frame, the heating plate, the pocket part, and the pocket tray when viewed from the lower side.

As illustrated in the drawings, the frame **60** may be seated on the top surface of the housing **50**. A frame opening **61** may be defined in a center of the frame **60**. The frame **60** may include a front pocket mounting part **63** and a plate mounting part **62** remaining except for the pocket mounting part **63**. Thus, a structure in which the heating plate **70** and a pocket part **90** are mountable may be provided in the frame opening **61** to define an outer appearance of a circumference of a top surface of the griddle device, which is exposed to the outside. The frame **60** may be made of the same cast iron material as the grating **31** used in the gas stove **30**. The frame **60** may be cast to have the same texture. Thus, the frame **60** may be structurally limited due to the limitation of the structure and the molding method of the molding frame.

Also, the frame **60** may provide a support surface seated on a case (not shown) defining an outer appearance thereof. When the frame **60** is mounted on the cooktop part **20** in a module type, the frame **60** may be detached in the module type.

In detail, when the griddle device **40** is mounted on the cooktop part **20** in the module type, the bottom surface of the housing **50** may be seated on a mounting bracket **202** disposed therebelow and be coupled by a coupling member

12

such as a screw. The mounting bracket **202** may be fixed inside the cooktop part **20** and support the griddle device **40** at the lower side.

Also, the mounting bracket **202** may be further fixed to the cooking apparatus **1** or the other side of the cooktop part **20** by a screw that sequentially passes through the pocket part **90** and the housing **50**.

Furthermore, an installation protrusion **603** inserted into an installation hole defined in a rear support **203** of the cooktop part **20** may protrude from a rear end of the frame **60**. A front end of the frame **60** may have a shape corresponding so that the frame **60** is seated on a seating part that is disposed to be stepped on the front support **204** of the cooktop part **20**.

Also, a side seating part **601** may be further disposed on a bottom surface of each of both left and right ends of the frame **60**. A side deco (not shown) may be disposed on the side seating part **601**. The side deco may cover other cooking modules **2**, which are successively disposed adjacent to the cooking apparatus, for example, a boundary that is adjacent to the gas stove **30**, an inductor, a sous vide cooking device, and the like. Also, when the griddle device **40** is mounted, the side deco may be disposed on the side seating part **601** to prevent the griddle device **40** from interfering with the side deco.

A vent part **64** may be provided in the rear end of the frame **60**. The vent part **64** may contact the rear end of the housing **50**, which extends to be inclined. Also, the vent part **64** may be opened in a grill shape to exhaust the combustion gas generated inside the housing, i.e., the heating space **501**.

Also, the heating plate **70** may be mounted on the frame **60**. The heating plate **70** may be heated by the flame of the burner **80** and made of a metal material having superior thermal transfer performance. Also, the top surface of the heating plate **70** may be molded to be adequate for heating and cooking food through surface treatment such as coating.

The heating plate **70** may cover the remaining opened area of the frame **60** except for the pocket part **90** and the vent part **64**. That is, both ends of the heating plate **70** may contact both ends of the frame opening **61**. The rear end of the heating plate **70** may contact the vent part **64**, and the front end of the heating plate **70** may extend up to a space in which the pocket part **90** is mounted.

The heating plate **70** may include a heating part **71** having a plate shape and providing a cooking surface to be heated and an edge part **72** extending vertically from a front end of the heating part **71** and each of both side ends of the heating part **71**.

The heating part **71** may have a plate shape having a relatively thick thickness. When the heating part **71** is heated by the flame of the burner **80**, the heating part **71** may have a thick thickness *s* that the entire surface of the heating part **71** have uniform temperature distribution. The heating part **71** may have a size corresponding to a size of the bottom surface of the heating space **501**, i.e., a size that is enough to cover the upper side of the burner body **82**. Thus, the entire surface of the heating part **71** may be uniformly heated by the ignition of the burner **80**.

The heating part **71** is connected to a lower end of the edge part **72**. Also, the heating part **71** may be disposed at a position that is lower than the top surface of the frame **60**. When viewed from the upper side, the heating part **71** may cover most of the frame opening **61** except for the area on which the pocket part **90** is disposed.

Also, when the heating part **71** is mounted, the edge part **72** may define a shape of a side surface contacting the frame **60** and vertically extend to have a predetermined height. An

13

upper end of the edge part 72 may contact the frame 60 to cover a space between the heating part 71 and the frame 60. The top surface of the heating part 71, i.e., a depth of the cooking space may be determined according to the height of the edge part 72.

A rear surface of the edge part 72 may contact a front end of the vent part 64, and both side surfaces of the edge part 72 may respectively contact both side surfaces of the frame 60. Also, a plate coupling hole 602 may be defined in each of both side surfaces of the frame 60. Also, a plate hole 721 may be defined in the edge part 72, which corresponds to the plate coupling hole 602. Thus, the coupling member 73 coupled to the plate hole by passing through the plate coupling hole 721 may be coupled through both the side surfaces of the frame 60. Thus, the heating plate 70 may be simply fixed and mounted on the frame 60 by the coupling member 73.

The edge part 72 may be configured to be coupled to the frame 60 and have a relative thin thickness so as to be coupled to the coupling member 73. The edge part 72 may have a thickness less than that of the heating part 71. Thus, the heating plate 70 may be provided by bonding the heating part 71 and the edge part 72, which have different thicknesses, through welding.

An opening protrusion 621, which protrudes inward, of the frame openings 61 of the frame 60 may be defined in an upper end of the plate mounting part 62. Also, the upper end of the edge part 72 may be closely attached to a bottom surface of the opening protrusion 621, and thus, both side surfaces and a rear surface of the space defined in an upper side of the heating part 71 may be substantially sealed with the frame 60. Thus, when the heating plate 70 is mounted, an upper end of the edge part 72 of the heating plate 70 may not be exposed but be covered by the opening protrusion 621.

Here, each of both side surfaces of the frame 60 may have a thickness that gradually increases upward, and each of both side surfaces of the frame opening 61 may be inclined due to characteristics of the molding of the frame 60 that is molded through casting using a mold.

The edge part 72 may not be disposed on the front end of the heating plate 70 and extend up to the pocket part 90. Thus, oil flowing down from the heating plate 70 or residue generated during the cooking may be introduced into the pocket part 90 through the front end of the heating plate 70.

The pocket mounting part 63 may be disposed on the front end of the frame opening 61. The pocket mounting part 63 may be covered by the pocket part 90 mounted therebelow. Also, both left and right sides of the pocket mounting part 63 may be recessed. Thus, in the frame opening 61, a stepped portion may be disposed between the pocket mounting part 63 and the plate mounting part 72 on which the heating plate 70 is mounted.

The pocket part 90 may be mounted on the pocket mounting part 63. The pocket part 90 may be fixed and mounted on the frame 60 and provide a space that is recessed inward. A pocket tray 95 for collecting the foreign substance or the oil, which flows down from the heating plate 70, may be accommodated in the pocket mounting part 63. The pocket tray 95 may be detachable without having a separate restricting structure. That, the pocket tray 95 may empty the foreign substance and oil when desired by the user. In the state in which the heating plate 70 and the pocket part 90 are mounted on the frame 60, when the frame 60 is coupled to the housing 50, the opened top surface of the housing 50 may be completely covered.

14

Hereinafter, structures of the frame 60 and the constituents coupled to the frame 60 will be described with reference to the accompanying drawings.

FIG. 13 is a partial perspective view illustrating a main part of the frame. Also, FIG. 14 is a partial perspective view illustrating a coupling state of the frame, the heating plate, and the pocket part. Also, FIG. 15 is a projective view illustrating a state in which the heating plate is separated in FIG. 14. Also, FIG. 16 is a partial perspective view illustrating a coupling state of the frame and the pocket part. Also, FIG. 17 is a projective view of the frame of FIG. 16.

As illustrated in FIG. 13, all of the heating plate 70, the barrier 51, and the pocket part 90 may be disposed on a front portion of both left and right sides of the inside of the frame opening 61, and these constituents may be coupled to each other without interfering with each other.

The pocket mounting part 63 may be recessed from each of both sides of an inner surface of the frame 60. Also, a tray seating part 631 may be disposed on the front end of the inside of the pocket mounting part 63. Also, an accommodation groove 632 may be defined in a lower end of the pocket mounting part 63. Also, the plate mounting part 72 may protrude inward from the lower end of the pocket mounting part 63. A first stepped part 641 and a second stepped part 642 may be vertically sequentially disposed on a lower portion of the front end of the plate mounting part 72.

When this structure is described in more detail with reference to FIGS. 14 to 17, the front end of the heating plate 70 may extend to the pocket mounting part 63 and also be disposed further behind both recessed left and right sides of the pocket mounting part 63. Thus, the vertical front end of the edge part 72 of the heating plate 70 and the stepped front end of the inclined side surface 722 of the plate mounting part 72 may not coincide with each other and be respectively disposed at front and rear sides. When viewed from the front side, a gap between the inclined inner surface of the plate mounting part 72 and the edge part 72 of the heating plate 70 may not be visibly emphasized due to this structure, and the space between the inner surface of the plate mounting part 72 and the edge part 72 may not be visible.

That is, the inner surface of the plate mounting part 72 may be inclined to facilitate the separation of the mold when the casting molding of the frame 60. Also, deterioration of the outer appearance due to the excessive exposure of the gap between the frame 60 and the heating plate 70 when the heating plate 70 is coupled may be prevented.

The tray seating part 631 on which the pocket tray 95 accommodated in the pocket part 90 is seated may be disposed on the upper end of the pocket mounting part 63. The tray seating part 631 may protrude from the front end of the inside of the pocket mounting part 63 and be disposed lower somewhat than the upper end of the pocket mounting part 63. Thus, when the pocket tray 95 is seated on the pocket mounting part 63, the top surface of the pocket tray 95 and the top surface of the frame 60 may be disposed on the same plane.

Also, accommodation groove that is recessed upward may be defined in the lower end of the pocket mounting part 63. When the pocket part 90 is mounted, left and right side parts 922 of the pocket part 90 may be accommodated in the accommodation groove 632. The accommodation groove 632 may have a size corresponding to each of both left and right side ends of the top surface of the pocket part 90. When the pocket part 90 is accommodated and mounted in the accommodation groove 632, the pocket part 90 may be

disposed in position, and holes **911**, **921a**, and **923a** for fixing and mounting the pocket part **90** may be aligned with each other.

The pocket part **90** may provide a pocket accommodation part **91** having an opened top surface and recessed downward. A pocket edge **92** protruding outward along a circumference of the upper end of the pocket part **90** may be provided. The pocket part **90** may be constituted by a front part **921**, a rear part **923**, and side parts **922** disposed on both left and right sides. The front part **921**, the rear part **923**, and the side parts **922** may be coupled to the frame **60** and the heating plate **70**.

In detail, the front part **921** of the pocket edge **92** may be coupled to a front coupling part **603** disposed on a bottom surface of the front end of the frame **60**. Here, a plurality of front holes **921a** may be defined in the front part **921**, and a corresponding hole **603a** may be defined in the bottom surface of the front end of the frame **60**. Also, the coupling member **921b** may be sequentially coupled to the front hole **921a** and the hole **603a** of the frame **60**. Thus, the front end of the pocket part **90** may be fixed to the front end of the frame **60** by the coupling of the coupling member **921b**.

The rear part **923** of the pocket part **90** may pass through a rear end of the pocket mounting part **63** to extend up to the plate mounting part **72**. The rear part **923** may contact the bottom surface of the heating plate **70**. Also, a rear surface coupling hole may be defined in the rear part **923**. The coupling member may pass from a lower side to the rear surface coupling hole **293b** and then be coupled to a hole **712** defined in the bottom surface of the heating plate **70**. That is, the rear end of the pocket part **90** and the heating plate **70** may be coupled to each other by the coupling member.

That is, the front and rear ends of the pocket part **90** may be fixed to the frame **60** and the heating plate **70**, respectively. Also, the pocket mounting part **63** may be covered by the pocket part **90**, and also, the front end of the frame **60** and the heating plate **70** may be connected to each other by the pocket part **90**.

The side parts **922** of the pocket part **90** may be accommodated in accommodation grooves **632** defined in both lower ends of the pocket mounting part **63**, respectively. Each of the side parts **922** may have a shape corresponding to each of the accommodation grooves **632**. Thus, the pocket part **90** may be disposed in position by the coupling of the accommodation groove **632** and the side part **922**, and thus, the holes **911**, **921a**, and **923a** may be aligned with each other. Also, both left and right ends of the pocket part **90** may be restricted by the accommodation grooves **632**, and thus, the pocket part **90** may be maintained in the more stably mounted state.

The first stepped part **641** and the second stepped part **642** may be vertically continuously disposed on the lower ends of both side surfaces contacting the pocket mounting part **63**. The first and second stepped parts **641** and **642** may be disposed further behind the front end of the heating plate **70** so as to be covered when the heating plate **70** is mounted.

Also, the first stepped part **641** may be disposed on a rear end of the accommodation groove **632**. When the barrier **51** is mounted, both side ends of the bent inclined part **512** of the barrier **51** may be disposed on the first stepped part **641**. Thus, the position of the inclined part **512** of the barrier **51** may be accurately maintained. When the heating plate **70** is mounted, even though the heating plate **70** presses the barrier **51**, the barrier **51** may not be separated or excessively bent, and thus, the upper end of the barrier **51** may be closely attached to the bottom surface of the heating plate **70**.

The lower end of the first stepped part **641** may contact an upper end of a partition part **511** of the barrier **51** to restrict upward movement of the barrier **51**. Also, the upper end of the partition part **511** may have a width less than that of the inclined part **512**. Thus, a stepped space may be defined between the partition part **511** and the inclined part **512**, and the first stepped part **641** may be disposed in the space between the partition part **511** and the inclined part **512**.

Also, the second stepped part **642** may be disposed above the first stepped part **641** and protrude further inward than the first stepped part **641**. A pocket inclined part **94** protruding from the upper end of the pocket part **90** may be disposed on the second stepped part **642**. When the pocket part **90** is mounted, the pocket inclined part **94** may be disposed on the second stepped part **642**, and an upper end of the pocket inclined part **94** may be restricted by the inner surface of the frame **60** and the stepped portion provided by the second stepped part **642**. Thus, the accurately mounted position of the pocket inclined part **94** may be maintained, and the pocket inclined part **94** may contact the bottom surface of the heating plate **70**.

The inner surface of the frame **60**, i.e., the inner surface of the plate mounting part **72** may further protrude inward than the second stepped part **642** above the second stepped part **642**, and the edge part **72** of each of both side surfaces of the heating plate **70** may be disposed above the second stepped part **642**.

The rear part **923** of the pocket part **90** may protrude backward from the upper end of the pocket part **90** and be provided in plurality at a certain interval. Also, the rear part **923** may contact the bottom surface of the heating plate **70** and be coupled to the heating plate **70**.

In the state in which the pocket part **90** and the barrier **51** are mounted, when the heating plate **70** is mounted, the portions at which the pocket part **90** and the barrier **51** contact the frame **60** and the structures of the inner surface of the frame **60** for coupling may be covered. Thus, when viewed from the upper side, the constituents of the griddle device **40** may be simple to more improve the outer appearance.

FIG. **18** is an exploded perspective view of the pocket part and the pocket tray when viewed from the upper side. FIG. **19** is an exploded perspective view of the pocket part and the pocket tray when viewed from the lower side.

As illustrated in the drawings, the pocket part **90** may have the same material as the frame **60** and be independently separately molded by the casting with respect to the frame **60**. As necessary, the pocket part **90** may be made of an adequate metal material in a different molding method.

The pocket part **90** may have a size and shape that are capable of covering the lower side of the pocket mounting part **63**. The pocket part **90** may include the pocket accommodation part **91** providing a space that is recessed downward and the pocket edge **92** that is bent outward from the upper end of the pocket accommodation part **91** as a whole.

The pocket accommodation part **91** may be recessed downward to define a space in which the pocket tray **95** is accommodated. Thus, the oil and the food waste flowing down during the cooking may be collected from the inside of the pocket accommodating part **91** and then discharged through the detachment of the pocket tray **95**.

The recessed depth of the pocket accommodation part **91** may extend up to a bottom surface of the insulation space **502** or a position adjacent to the bottom surface of the insulation space **502**. Thus, as illustrated in FIG. **21**, the coupling member **93** passing through the coupling hole **911** defined in the bottom surface of the pocket accommodation

part 91 may sequentially pass through the housing and then be coupled. The state in which the pocket part 90 is fixed to the housing 50 may be maintained by the coupling of the coupling member 93, and the heating plate 70 and the frame 60, which are fixed to the pocket part 90, may be integrally fixed. Thus, the coupling member 93 may be released to release the coupling of the pocket part 90 and the housing 50 so as to be separated from the housing 50. The coupling member 93 may be fixed and mounted on the case of the cooking apparatus 1 or the mounting bracket 202 of the cooktop part 20.

The pocket edge 92 may have a predetermined width outward along the opened upper end and be constituted by the rear part 923, the front part 921, and the side part 922.

Particularly, the rear part 923 may be disposed at a position corresponding to the inclined part 512 of the barrier 51, and the upper end of the pocket part 90 may be pressed to be coupled to the bottom surface of the heating plate 70 by the coupling of the coupling member 923b. Thus, the heating plate 70 and the pocket part 90 may be coupled to each other in the state of being completely closely attached to each other to prevent a gap from occurring therebetween. Thus, in addition to primary thermal blocking by the barrier 51, transfer of heat through the gap between the heating plate 70 and the pocket part 90 into the pocket part 90 may be prevented.

The rear part 923 may be disposed along the rear end of the pocket accommodation part 91 as a whole. Also, the rear part 923 may further extend backward at only a position in which the coupling hole 923a is defined.

The pocket part 90 may be ignited at the time of an occurrence of heat transfer due to the use characteristics in which the oil is collected. Thus, the pocket part 90 may have an effect of preventing fire due to such a thermal blocking structure.

In the griddle having the structure in which the pocket part is integrally cost and molded with the frame, but having the structure according to an embodiment, a pressing contact structure between the heating plate and the upper end of the pocket part may not be provided. Thus, heat in the heating space may be transferred into the pocket part. This may be caused by surface roughness, tolerance, and assembling failure that occur during the molding of the frame and may be a factor causing fire in some case.

The pocket tray 95 may be accommodated in the pocket accommodation part 91 of the pocket part 90. The pocket tray 95 may have a recessed space for collecting the oil and the food waste flowing down from the front end of the heating plate 70 in the pocket accommodation part 91.

In detail, the pocket tray 95 may include a tray body 951 accommodated in the pocket accommodation part 91 and having a recessed space, a tray extension part 952 extending upward from a front end of the tray body 951, and a handle 953 bent to be held by the user at an upper end of the tray extension part 952.

The handle 953 may have a planar shape and be disposed at a height corresponding to the top surface of the frame 60. Also, both ends of the handle 953 may be seated on the tray seating part 631 of the pocket mounting part 63. The handle 953 may be made of a material having low thermal conductivity so that the user more easily detaches the pocket tray 95. Also, when the pocket tray 95 is mounted, the pocket tray 95 may occupy most of the inner space of the pocket accommodation part 91. Particularly, the coupling member coupled inside the pocket accommodation part 91 may be covered.

Also, in the state in which the pocket tray 95 is mounted inside the pocket accommodation part 91, the rear end of the pocket tray 95 may be disposed below the heating plate 70 and also be disposed further behind the front end of the heating plate 70. Thus, all of the foreign substance and oil flowing along the heating plate 70 and the oil formed on the end of the heating plate 70 may be introduced into the pocket tray 95.

FIG. 20 is a cutaway perspective of the griddle. Also, FIG. 21 is an enlarged view of a portion "B" of FIG. 20. Also, FIG. 22 is an enlarged view of a portion "C" of FIG. 7.

As illustrated in the drawings, in the state in which the pocket part 90 is mounted, the front end of the heating plate 70 may further extend to the inside of the pocket part 90. That is, the front end of the heating plate 70 may protrude from the rear end of the pocket part 90. Also, a plate groove 711 may be defined in the bottom surface of the heating plate 70 protruding to the inside of the pocket part 90.

The plate groove 711 may extend up to each of both left and right ends of the heating plate 70 and have a predetermined depth. Thus, when the oil flowing down along a surface of the heating plate 70 flows along the front end of the heating plate 70, the oil may be collected in the plate groove 711 to drop down. As a result, the oil may not be introduced into the gap between the heating plate 70 and the upper end of the pocket part 90 but drop down into the pocket tray 95 so as to be collected in the pocket tray.

Also, the pocket inclined part 94 may be further disposed on the rear part 923 of the pocket part 90 contacting the bottom surface of the heating plate 70. The pocket inclined part 94 may have an inclination that gradually increases backward. The upper end of the pocket inclined part 94 may contact the bottom surface of the heating plate 70, which is disposed behind the plate groove 711. Thus, even though the oil flowing along the bottom surface of the heating plate 70 by passing through the plate groove 711 flows, the oil may also flow down along the inclined surface of the pocket inclined part 94 to prevent the oil from being introduced into the heating space 501.

Also, the rear part 923 may be firmly coupled to the bottom surface of the heating plate 70 by the coupling member 923b to prevent the heat of the heating space 501 from being transferred to the pocket part 90 and also prevent the oil of the pocket part 90 from being introduced into the heating space 501.

Also, a contact part of the barrier 51 may be pressed downward by the bottom surface of the heating plate 70, and thus, the barrier 51 may be closely attached to the heating plate 70 by elasticity of the inclined part 512 of the barrier 51. Due to this structure, the heating space 501 may be more sealed, and thus, the heat of the heating space 501 may be prevented from being transferred to the pocket part 90.

Also, the rear part 923 may be disposed in the space defined by the inclined part 512 of the barrier 51, and the coupled structure of the rear part 923 and the heating plate 70 may also be disposed in the upper space of the inclined part 512.

The pocket part 90 may be coupled to the housing 50 by the coupling member 93 coupled to the bottom of the pocket part 90. Thus, when the pocket tray 95 is removed, and the coupling member 93 is released, the housing 50 and the frame 60 may be separated from each other.

The griddle device and the cooking apparatus having the same according to the embodiment may have the following effects.

In the griddle device according to an embodiment, the oil generated during the cooking may be prevented from being

introduced to minimize the possibility of the fire due to the introduction of the oil, thereby securing the safety.

In the griddle device according to the embodiment, the heating plate may be easily coupled and fixed by the coupling member that is coupled from one side thereof, thereby improving the workability and the productivity.

Also, the pocket part may be separately provided to be coupled to the frame. Thus, the frame may be more simplified in structure and also be molded through the casting.

In addition, the pocket part may be simply and easily coupled to the housing and the heating plate by the coupling member, thereby more improving the workability and the productivity.

Also, the inclined surface of the frame and the end of the side surface of the heating plate may be disposed to be misaligned. When the frame and the heating plate are coupled to each other, the gap may be prevented from standing out, thereby more improving the quality of the outer appearance.

In the cooking apparatus according to the embodiment, the various cooking modules including the griddle may be disposed in the cooktop part to improve the use convenience.

Particularly, the cooking modules including the griddle may be variously combined with each other on the cooktop part, and also, the cooking module having a necessary function may include the griddle and be provided in plurality to be selectively mounted.

Also, the cooking modules may be provided to have the same length in the front and rear direction and the width that is equal to the unit length or a multiple of the unit length. Thus, the cooking module may be freely disposed within the unit area provided on the cooktop part.

Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the spirit and scope of the principles of this disclosure. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

What is claimed is:

1. A griddle device, comprising:

a housing having an open top surface;

a burner provided in the housing;

a heating plate provided above the housing and providing a surface heated by the burner;

a pocket provided in the housing and recessed to provide a space in which oil or residue generated during cooking are accommodated; and

a barrier that is disposed in the housing and partitions an inner space of the housing into a first space in which the burner is accommodated and a second space in which the pocket is accommodated, wherein the barrier comprises:

a partition that vertically extends from a bottom surface of the housing; and

an inclined portion that extends at an incline from an upper end of the partition, and wherein when the heating plate is mounted, the inclined portion is elastically deformed to press and support the heating plate.

2. The griddle device according to claim 1, wherein the barrier partitions an inside of the housing into front and rear

spaces, wherein the pocket is accommodated in the front space, and wherein the burner is accommodated in the rear space.

3. The griddle device according to claim 2, wherein a gas valve and a connection tube that connects the gas valve to the burner are disposed in the front space.

4. The griddle device according to claim 3, wherein a barrier cutoff portion is formed at a lower portion of the barrier, and wherein at least a portion of the burner is connected to the connection tube through the barrier cutoff portion.

5. The griddle device according to claim 2, wherein a bottom surface of the front space is positioned higher than a bottom surface of the rear space to support the pocket, and wherein the bottom surface of the front space is formed above the burner.

6. The griddle device according to claim 1, wherein the barrier is formed in the shape of a plate that is at least partially inclined, and extends upward more than the open top surface so that the barrier is elastically deformed in a state of supporting a bottom surface of the heating plate.

7. The griddle device according to claim 1, wherein a barrier fixing portion is bent on each of both ends of the partition to be fixed to each of both side surfaces of the housing.

8. The griddle device according to claim 1, wherein a contact portion is bent from an upper end of the inclined portion to support a bottom surface of the heating plate.

9. The griddle device according to claim 1, wherein a frame is disposed along an open perimeter of an upper end of the housing and having a frame opening, and wherein the heating plate and pocket are coupled to the frame to cover the frame opening.

10. The griddle device according to claim 9, wherein the inclined portion has a width less than a width of the partition so that a barrier stepped portion is disposed on each of both side ends of the inclined portion and the partition, and wherein the barrier stepped portion is seated on a first stepped portion that is stepped on an inner surface of the frame opening.

11. The griddle device according to claim 10, wherein a second stepped portion in which an upper end of the pocket is accommodated is further disposed on an inner surface of the frame opening above the first stepped portion, and wherein the second stepped portion further protrudes than the first stepped portion.

12. The griddle device according to claim 11, wherein the heating plate further extends to an inside of the space of the pocket.

13. The griddle device according to claim 12, wherein a plate groove is recessed from a bottom surface of the heating plate, and wherein the plate groove is disposed inside of the space of the pocket.

14. The griddle device according to claim 13, wherein an upper end of the barrier that contacts the bottom surface of the heating plate is located at a rear of the plate groove.

15. The griddle device according to claim 13, wherein a front end of the pocket is coupled with the frame, and a rear end of the pocket is coupled with the heating plate at a rear of the plate groove.

16. The griddle device according to claim 9, wherein the heating plate comprises:

a heating part portion that provides a cooking surface; and

an edge portion that is disposed along a perimeter of the heating portion and extends upward from the heating portion to contact an inner surface of the frame open-

21

ing, and wherein the heating portion has a thickness greater than a thickness of the edge portion.

17. The griddle device according to claim 16, wherein a coupling member coupled to the edge portion by passing through the frame is disposed on an outer surface of the frame. 5

18. A griddle device, comprising:
 a housing having an open top surface;
 a burner provided in the housing;
 a heating plate provided above the housing and providing a surface heated by the burner; 10
 a pocket provided in the housing and recessed to provide a space in which oil or residue generated during cooking are accommodated;
 a barrier that is disposed in the housing and partitions an inner space of the housing into a first space in which the burner is accommodated and a second space in which the pocket is accommodated, wherein the barrier 15

22

extends from a bottom of the housing to the heating plate to support the heating plate, wherein a frame opening comprises:

a plate mounting portion on which the heating plate is mounted; and
 a pocket mounting portion on which the pocket is mounted at one end of the plate mounting portion, wherein the pocket mounting portion has a width greater than a width of the plate mounting portion, and both ends of the pocket mounting portion further recessed than the plate mounting portion.

19. The griddle device according to claim 18, wherein a pocket tray is detachably accommodated inside of the pocket, and wherein a tray seat on which each of both ends of the pocket tray is seated is disposed on each of both side surfaces of the pocket mounting portion.

* * * * *